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## U. S. DEPARTMENT OF AGRICULTURE.

OFFICE OF EXPERIMENT STATIONS—BULLETIN 212.

A. C. TRUE, Director.

## PROCEEDINGS

OF THE

## TWENTY-SECOND ANNUAL CONVENTION

OF THE

ASSOCIATION OF AMERICAN AGRICULTURAL COLLEGES  
AND EXPERIMENT STATIONS,

HELD AT

WASHINGTON, D. C., NOVEMBER 18-20, 1908.

Edited by

A. C. TRUE AND W. H. BEAL,

FOR THE OFFICE OF EXPERIMENT STATIONS,

and

H. C. WHITE,

FOR THE EXECUTIVE COMMITTEE OF THE ASSOCIATION.



WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1909.

## THE OFFICE OF EXPERIMENT STATIONS.

A. C. TRUE, Ph. D.—*Director.*

E. W. ALLEN, Ph. D.—*Assistant Director and Editor of Experiment Station Record.*

W. H. BEAL, B. A., M. E.—*Chief of Editorial Division.*

(2)



## LETTER OF TRANSMITTAL.

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U. S. DEPARTMENT OF AGRICULTURE,  
OFFICE OF EXPERIMENT STATIONS,  
*Washington, D. C., March 10, 1909.*

SIR: I have the honor to transmit herewith for publication Bulletin 212 of this Office, containing the proceedings of the Twenty-second Annual Convention of the Association of American Agricultural Colleges and Experiment Stations, held at Washington, D. C., November 18-20, 1908.

Respectfully,

A. C. TRUE,  
*Director.*

Hon. JAMES WILSON,  
*Secretary of Agriculture.*



# CONTENTS

	Page.
Officers and committees of the association.....	7
List of delegates and visitors in attendance.....	9
Constitution .....	11
Minutes of the general session .....	15
Report of the executive committee.....	15
Report of treasurer.....	17
Report of committee on graduate study.....	17
Report of third session of the Graduate School of Agriculture.....	18
Receipts and expenditures on account of Graduate School of Agriculture, 1908.....	26
Military instruction in land-grant colleges.....	26
Address of Commissioner Brown .....	27
Presidential address—Agriculture and democracy.....	28
Address of T. C. Atkeson, representing the National Grange.....	28
Resolution regarding Denver meeting.....	29
Resolution regarding anniversary celebration.....	29
Report of committee on the history of agricultural education.....	30
Report of bibliographer.....	31
Address of W. L. Post, superintendent of documents.....	32
Report of committee on instruction in agriculture.....	35
Report of commission on agricultural research.....	38
Place of next meeting.....	38
Anniversary celebration .....	38
Report of committee on extension work.....	39
Proposed amendment to the constitution.....	44
Election of officers.....	44
Affiliation of agricultural organizations .....	46
Annual dues .....	47
Engineering experiment stations .....	47
Carnegie Foundation .....	47, 49
Resolution regarding tariff on basic slag.....	47
Report of committee on station organization and policy.....	47
Committee to wait upon the President-elect of the United States.....	48
Place of meeting of the next Graduate School of Agriculture .....	48
National Grange.....	49
Resolution regarding Secretary Wilson.....	52
Minutes of the sections .....	53
Section on college work and administration .....	53
Rural versus urban conditions in the determination of educational policy .....	53
The value of general culture in technical courses in the land-grant colleges.....	65

## Minutes of the sections—Continued.

## Section on college work and administration—Continued.

	Page.
Administrative methods in American colleges .....	68
The extent to which military discipline should be applied in agricultural colleges.....	77
Election of officers of the section and members of the executive committee .....	87
Section on experiment station work .....	88
Bovine tuberculosis.....	88
The relation of dairy by-products to the spread of tuberculosis ..	94
The Bang method of controlling tuberculosis.....	98
Nominating committee .....	104
Relation of the experiment station to work in instruction, with special reference to its popular phase .....	105
Election of officers of the section and members of the executive committee .....	120
Index of names .....	121

## OFFICERS AND COMMITTEES OF THE ASSOCIATION.

---

### *President.*

M. A. SCOVELL, of Kentucky.

### *Vice-Presidents.*

W. J. KERR, of Oregon;

H. T. FRENCH, of Idaho;

C. E. THORNE, of Ohio;

W. D. GIBBS, of New Hampshire;

A. B. STORMS, of Iowa.

### *Secretary and Treasurer.*

J. L. HILLS, of Vermont.

### *Bibliographer.*

A. C. TRUE, of Washington, D. C.

### *Executive Committee.*

W. O. THOMPSON, of Ohio, *Chairman*;

J. L. SNYDER, of Michigan;

W. H. JORDAN, of New York;

W. E. STONE, of Indiana;

C. F. CURTISS, of Iowa.

### OFFICERS OF SECTIONS.

#### *College Work and Administration.*

P. H. MELL, of South Carolina, *Chairman*.

W. J. KERR, of Oregon, *Secretary*.

*Programme Committee*.—The Chairman and Secretary of the Section.

#### *Experiment Station Work.*

P. H. ROLFS, of Florida, *Chairman*.

E. J. WICKSON, of California, *Vice-Chairman*.

F. B. LINFIELD, of Montana, *Secretary*.

*Programme Committee*.—The Chairman and Secretary of the Section, and E. H. JENKINS, of Connecticut.

### STANDING COMMITTEES.

#### *Instruction in Agriculture.*

For three years, A. C. TRUE, of Washington, D. C., *Chairman*, and T. F. HUNT, of Pennsylvania; for two years, H. T. FRENCH, of Idaho, and H. C. WHITE, of Georgia; for one year, J. F. DUGGAR, of Alabama, and W. E. STONE, of Indiana.

*Graduate Study.*

For three years, H. P. ARMSBY, of Pennsylvania, and HOWARD EDWARDS, of Rhode Island; for two years, M. H. BUCKHAM, of Vermont; for one year, W. O. THOMPSON, of Ohio, and BROWN AYRES, of Tennessee.

*Extension Work.*

For three years, K. L. BUTTERFIELD, of Massachusetts, *Chairman*, and C. R. VAN HISE, of Wisconsin; for two years, W. C. LATTA, of Indiana, and C. F. CURTISS, of Iowa; for one year, A. M. SOULE, of Georgia, and W. M. HAYS, of Washington, D. C.

*Experiment Station Organization and Policy.*

For three years, EUGENE DAVENPORT, of Illinois, *Chairman*, and C. D. WOODS, of Maine; for two years, H. J. WHEELER, of Rhode Island, and E. B. VOORHEES, of New Jersey; for one year, M. A. SCOVELL, of Kentucky, and C. E. THORNE, of Ohio.

## LIST OF DELEGATES AND VISITORS IN ATTENDANCE.

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- Alabama: J. F. Duggar, delegate.
- Arkansas: J. N. Tillman and C. F. Adams, delegates.
- California: B. I. Wheeler, E. J. Wickson, and M. E. Jaffa, delegates; A. R. Ward, visitor.
- Colorado: B. O. Aylesworth and L. G. Carpenter, delegates; Mrs. H. L. McNair, visitor.
- Connecticut: C. L. Beach, L. A. Clinton, and E. H. Jenkins, delegates; C. Thom, visitor.
- Delaware: G. A. Harter and M. T. Cook, delegates; G. G. Kerr, visitor.
- Florida: A. Sledd and P. H. Rolfs, delegates.
- Georgia: A. M. Soule and H. C. White, delegates; J. S. Carroll, visitor.
- Idaho: H. T. French, delegate.
- Illinois: E. Davenport and C. G. Hopkins, delegates; H. A. Huston and F. H. Rankin, visitors.
- Indiana: W. E. Stone and J. H. Skinner, delegates; G. I. Christie and W. C. Latta, visitors.
- Iowa: A. B. Storms, C. F. Curtiss, and W. O. McElroy, delegates; C. R. Benton, P. G. Holden, G. E. McLean, and H. E. Summers, visitors.
- Kansas: E. R. Nichols and J. T. Willard, delegates.
- Kentucky: J. K. Patterson, M. A. Scovell, and A. M. Miller, delegates; C. M. Hanna, Mrs. J. K. Patterson, M. C. Rankin, W. H. Scherffius, and Mrs. M. A. Scovell, visitors.
- Louisiana: W. R. Dodson, delegate.
- Maine: G. E. Fellows and C. D. Woods, delegates; W. D. Hurd and B. W. McKen, visitors.
- Maryland: R. W. Silvester, H. J. Patterson, and S. S. Buckley, delegates; C. P. Close, H. Gwinner, H. B. McDonnell, C. W. Melick, J. B. S. Norton, P. M. Novik, and T. B. Symons, visitors.
- Massachusetts: C. H. Fernald and W. P. Brooks, delegates; W. H. Bowker, J. A. Foord, E. B. Holland, F. W. Rane, and Mrs. F. W. Rane, visitors.
- Michigan: J. L. Snyder and R. S. Shaw, delegates; F. N. Clark, C. E. Marshall, A. E. Spencer, and L. R. Taft, visitors.
- Minnesota: T. L. Haecker and A. Boss, delegates; H. Snyder, visitor.
- Mississippi: J. C. Hardy and W. L. Hutchinson, delegates; E. R. Lloyd, visitor.
- Missouri: H. J. Waters, delegate.
- Montana: J. M. Hamilton and F. B. Linfield, delegates; C. A. Duniway, visitor.
- Nebraska: E. B. Andrews, E. A. Burnett, H. R. Smith, and W. P. Snyder, delegates; Mrs. E. A. Burnett, V. Keyser, and Mrs. W. P. Snyder, visitors.
- Nevada: G. H. True, delegate.
- New Hampshire: W. D. Gibbs and E. D. Sanderson, delegates; F. W. Taylor, visitor.
- New Jersey: W. H. S. Demarest and E. B. Voorhees, delegates; J. G. Lipman and J. B. Smith, visitors.



- New Mexico:** W. E. Garrison and L. Foster, delegates.
- New York:** G. W. Cavanaugh, T. L. Lyon, and W. H. Jordan, delegates; C. W. Burkett, H. A. Harding, Mrs. H. S. Harding, V. A. Moore, W. S. Myers, R. A. Pearson, W. P. Pollock, and B. von Herff, visitors.
- North Carolina:** D. H. Hill and F. L. Stevens, delegates; T. Butler, R. S. Curtis, B. W. Kilgore, and Mrs. W. N. Hutt, visitors.
- North Dakota:** J. H. Worst and J. H. Shepperd, delegates; T. A. Haverstad, visitor.
- Ohio:** H. C. Price, C. E. Thorne, and G. E. Scott, delegates; R. W. Dunlap and C. W. Montgomery, visitors.
- Oklahoma:** J. H. Connell, delegate; J. W. L. Corley and J. C. Elliott, visitors.
- Oregon:** W. J. Kerr and J. Withycombe, delegates.
- Pennsylvania:** E. E. Sparks, T. F. Hunt, and H. P. Armsby, delegates; W. H. Bishop, F. W. Card, W. Frear, and J. H. Washburn, visitors.
- Rhode Island:** H. Edwards and H. J. Wheeler, delegates; J. J. Dunn, W. E. Ranger, W. Sherman, A. E. Stene, and C. H. Ward, visitors.
- South Carolina:** P. H. Mell, J. N. Harper, and T. E. Miller, delegates; M. L. Donaldson and C. D. Mann, visitors.
- South Dakota:** J. W. Wilson, delegate; J. S. Cole, visitor.
- Tennessee:** S. M. Bain and H. A. Morgan, delegates.
- Texas:** H. H. Harrington, delegate.
- Utah:** L. A. Merrill and E. D. Ball, delegates.
- Vermont:** M. H. Buckham and J. L. Hills, delegates.
- Virginia:** S. W. Fletcher and C. K. Graham, delegates; T. C. Johnson, C. C. Poindexter, and W. S. Sweetser, visitors.
- Washington:** R. W. Thatcher, delegate.
- West Virginia:** D. W. Working and A. L. Dacy, delegates; T. C. Atkeson, visitor.
- Wisconsin:** L. E. Reber and H. L. Russell, delegates.
- Wyoming:** C. O. Merica and J. D. Towar, delegates; H. G. Knight, visitor.
- United States Department of Agriculture:** W. M. Hays, Assistant Secretary, delegate; A. C. True, delegate; W. H. Beal, T. K. Burrows, D. J. Crosby, L. M. Eidsness, W. H. Evans, S. Fortier, Mrs. S. Fortier, E. J. Glasson, J. Hamilton, G. A. Harlow, W. A. Hooker, H. L. Knight, W. G. Lehmann, J. B. Morman, E. W. Morse, J. I. Schulte, and Miss E. W. Thomas, visitors, Office of Experiment Stations; E. H. Webster and I. C. Weld, visitors, Bureau of Animal Industry; S. Leavitt, C. C. Moore, and L. M. Tolman, visitors, Bureau of Chemistry; A. D. Hopkins, visitor, Bureau of Entomology; C. R. Ball, D. A. Brodie, J. S. Cates, N. A. Cobb, L. C. Corbett, H. B. Derr, A. D. McNair, G. H. Powell, C. L. Shear, C. B. Smith, and J. M. Westgate, visitors, Bureau of Plant Industry; Jasper Wilson, visitor, Office of the Secretary; L. A. Beach, visitor.
- War Department:** Maj. Gen. J. Franklin Bell, Chief of Staff, U. S. Army, and Col. Frederick Füger, U. S. Army, visitors.
- Bureau of Education:** E. E. Brown, delegate.
- Government Printing Office:** W. L. Post, visitor.
- Canada:** G. C. Creelman, B. L. Emslie, G. A. Gigault, R. Harcourt, G. A. Putnam, J. W. Robertson, and C. A. Zavitz, visitors.
- South Africa:** F. B. Smith, visitor.



## CONSTITUTION.

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### NAME.

This association shall be called the Association of American Agricultural Colleges and Experiment Stations.

### OBJECT.

The object of this association shall be the consideration and discussion of all questions pertaining to the successful progress and administration of the colleges and stations included in the association, and to secure to that end mutual cooperation.

### MEMBERSHIP.

(1) Every college established under the act of Congress approved July 2, 1862, or receiving the benefits of the act of Congress approved August 30, 1890, and every agricultural experiment station established under State or Congressional authority, the Bureau of Education of the Department of the Interior, the Department of Agriculture, and the Office of Experiment Stations of the last-named Department, shall be eligible to membership in this association.

(2) Any institution a member of the association in full standing may send any number of delegates to the meetings of the association. The same delegate may represent both a college and a station, but shall vote in only one section and shall cast only one vote in general sessions. Other delegates may be designated by any institution to represent it in specified divisions of the sections of the association, but such delegates shall vote only in such divisions, and no institution shall be allowed more than one vote in any sectional meeting.

(3) Delegates from other institutions engaged in educational or experimental work in the interest of agriculture or mechanic arts may, by a majority vote, be admitted to conventions of the association, with all privileges except the right to vote.

(4) In like manner, any person engaged or directly interested in agriculture or mechanic arts who shall attend any convention of this association may be admitted to similar privileges.

### SECTIONS.

(1) The association shall be divided into two sections: (a) A section on college work and administration, (b) a section on experiment station work.

The section on college work and administration shall be composed of the presidents or acting presidents of colleges and universities represented in the association, or other representatives of such institutions duly and specifically accredited to this section, and no action on public and administrative questions shall be final without the assent of this section.

The section on experiment station work shall be composed of the directors or acting directors of experiment stations represented in the association, or of other representatives of such stations duly and specifically accredited to this section.

(2) Members of these two sections (and no others) shall be entitled to vote both in general sessions and in the section to which they respectively belong.

The representative appointed by the United States Bureau of Education shall be assigned to the section on college work and administration: the representative of the Office of Experiment Stations to the section on experiment station work; and the representative of the United States Department of Agriculture to either section as he may elect and the section by vote authorize; but such election once made and authorized may not be changed during the sessions of a given convention.

Each section may create such divisions as it may from time to time find desirable, and shall elect its own chairman and secretary for sectional meetings whose names shall be reported to the association for record.

(3) Each section shall conduct its own proceedings and shall keep a record of the same, and no action of a section, by resolution or otherwise, shall be valid until the same shall have been ratified by the association in general session, and in the case provided for in the foregoing paragraph (1) shall also have been approved by the section on college work and administration.

#### MEETINGS.

(1) This association shall hold at least one meeting in every calendar year, to be designated as the annual convention of the association. Special meetings may be held at other times, upon the call of the executive committee, for purposes to be specified in the call.

(2) The annual convention of the association shall comprise general sessions and meetings of the sections, and provision shall be made therefor in the programme. Unless otherwise determined by vote, the association will meet in general session in the forenoons and evenings of the convention and the sections in the afternoons.

#### OFFICERS.

(1) The general officers of this association, to be chosen annually, shall be a president, five vice-presidents, a bibliographer, and a secretary, who shall also be treasurer; and an executive committee of five members, three of whom shall be chosen by the section on college work and administration and two by the section on experiment station work: *Provided, however,* That a member chosen by either section need not be a member of that section. The executive committee shall choose its own chairman.

(2) Each section shall, by ballot, nominate to the association in general session for its action a chairman and a secretary for such section.

(3) The president, vice-presidents, secretary, and bibliographer of this association shall be elected by ballot upon nomination made upon the floor of the convention and shall hold office from the close of the convention at which they are elected until their successors shall be chosen.

(4) Any person being an accredited delegate to an annual meeting of the association, or an officer of an institution which is a member of the association in full standing at the time of election, shall be eligible to office.

#### DUTIES OF OFFICERS.

(1) The officers of the association shall perform the duties which usually devolve upon their respective offices.

(2) The president shall deliver an address at the annual convention before the association in general session.

(3) The executive committee shall determine the time and place of the annual conventions and other meetings of the association and shall between such con-

ventions and meetings act for the association in all matters, of business. It shall issue its call for the annual conventions of the association not less than sixty days before the date on which they are to be held and for special meetings not less than ten days before such date. It shall be charged with the general arrangements and conduct of all meetings called by it. It shall designate the time and place of the convention. It shall present a well-prepared order of business—of subjects for discussion—and shall provide and arrange for the meetings of the several sections. The subjects provided for consideration by each section at any convention of the association shall concentrate the deliberations of the sections upon not more than two lines of discussion, which lines, as far as possible, shall be related. Not more than one-third of the working time of any annual convention of the association shall be confined to miscellaneous business.

#### FINANCES.

At every annual convention the association in general session shall provide for obtaining the funds necessary for its legitimate expenses and may, by appropriate action, call for contributions upon the several institutions eligible to membership; and no institution shall be entitled to representation or participation in the benefits of the association unless such institution shall have made the designated contribution for the year previous to that in and for which such question of privilege shall arise, or shall have said payment remitted by the unanimous vote of the executive committee.

#### AMENDMENTS.

This constitution may be amended at any regular convention of the association by a two-thirds vote of the delegates present, if the number constitute a quorum: *Provided*, That notice of any proposed amendment, together with the full text thereof and the name of the mover, shall have been given at the next preceding annual convention and repeated in the call for the convention. Every such proposition of amendment shall be subject to modification or amendment in the same manner as other propositions, and the final vote on the adoption or rejection shall be taken by yeas and nays of the institutions then and there represented.

#### RULES OF ORDER.

(1) The executive committee shall be charged with the order of business, subject to special action of the convention, and this committee may report at any time.

(2) All business or topics proposed for discussion and all resolutions submitted for consideration of the convention shall be read and then referred, without debate, to the executive committee, to be assigned positions on the programme.

(3) Speakers invited to open discussion shall be entitled to twenty minutes each.

(4) In general discussions the ten-minute rule shall be enforced.

(5) No speaker shall be recognized a second time on any one subject while any delegate who has not spoken thereon desires to do so.

(6) The hours of meeting and adjournment adopted with the general programme shall be closely observed, unless changed by a two-thirds vote of the delegates present.

(7) The presiding officer shall enforce the parliamentary rules usual in such assemblies and not inconsistent with the foregoing.

(8) Vacancies which may arise in the membership of standing committees by death, resignation, or separation from the association of members, shall be filled by the committees, respectively.



# PROCEEDINGS OF THE ASSOCIATION OF AMERICAN AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS.

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## MINUTES OF THE GENERAL SESSION.

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MORNING SESSION, WEDNESDAY, NOVEMBER 18, 1908.

The convention was called to order at 10 o'clock a. m. at the Shoreham Hotel, Washington, D. C., by President J. L. Snyder, of Michigan.

Prayer was offered by M. H. Buckham, of Vermont.

After the call of the roll of delegates to the convention and the admission to the privileges of the floor of F. B. Smith, of the Department of Agriculture of the Transvaal; C. A. Zavitz, of the Ontario Agricultural College; J. W. Robertson, of Macdonald College, Quebec; Daniel Hall, secretary of the New Zealand Agricultural Society; and M. C. Rankin, acting commissioner of agriculture of Kentucky, H. C. White, of Georgia, chairman, presented the report of the executive committee, as follows:

### REPORT OF THE EXECUTIVE COMMITTEE.

The executive committee appointed at the twenty-first annual convention of the association held at Lansing, Mich., May 28-30, 1907, organized by the selection of H. C. White, of Georgia, as chairman. The chairman cooperated with the Office of Experiment Stations, United States Department of Agriculture, in editing the proceedings of the convention, which issued in October. By special order of the convention the presidential address, "The State and the Farmer," Dean L. H. Bailey, New York, was issued in pamphlet form, and the full address was therefore omitted from the proceedings.

The usual routine matters have engaged the attention of the committee since adjournment of the last convention.

The committee appeared before the Senate and House Committees on Agriculture and urged favorable consideration of the increased appropriations asked for the Office of Experiment Stations in the agricultural appropriation bill for the general work of the Office, for enlarging the abstracts of the Experiment Station Record, and for support of the work in agricultural education.

Special attention was given the bill (H. R. 9230) introduced in Congress by Mr. McKinley, of Illinois, at the instance of the authorities of the University of Illinois, providing for the establishment of engineering experiment stations in connection with the land-grant colleges. No opportunity was afforded for consideration of the bill in the House or by the Committee on Agriculture, to which it was referred. Moreover, difficulties arose in adjusting the interests of State universities having engineering departments in States in which the land-grant college is separate from the State university. Through the efforts of Mr. McKinley and the authorities of the University of Illinois a considerable sentiment has been created favorable to the establishment of engineering experiment sta-



tions under conditions similar to those of the agricultural experiment stations. Care will be required in framing the terms of a Federal act for the purpose which shall secure the full advantage of this sentiment and satisfy conflicting interests. The committee recommend that the matter be referred to the executive committee with instructions to give it prompt and careful attention.

Obedying the instructions of the association, the committee conferred with the Secretary of Agriculture, addressed communications to the board of trustees of the Pennsylvania State College, and took other steps to secure encouragement and support of the institute of animal nutrition at the Pennsylvania State College. It is not quite clear how the interests of this important enterprise may be advanced by this association, excepting through cordial approval and moral support.

Acting under instructions of the association, the chairman of the committee, in company with representatives of State universities, appeared before the trustees of the Carnegie Foundation for the Advancement of Teaching, in New York, in November, 1907, and subsequently before the executives of the Foundation in Chicago, and urged the admission of the land-grant colleges to the benefits of the Foundation. As the association has been advised by circular, the munificence of Mr. Carnegie in adding \$5,000,000 to the endowment of the Foundation, enabled the trustees, with the approval of Mr. Carnegie, to extend the benefits of the Foundation to tax-supported and State-controlled institutions of higher learning competent to meet the general requirements of institutions admitted to the accepted list of the Foundation. In the action of the trustees the land-grant colleges, as such, are not specifically named—nor, indeed, are State universities or other State-controlled institutions. In general terms public institutions are declared to be eligible, equally with private institutions, to admission to the accepted list. It is proper to say that the trustees of the Foundation, while very sympathetic and appreciative in their attitude toward the peculiar work of the land-grant colleges, are extremely solicitous that their action shall not operate in any manner to the possible detriment of public service of these institutions, by causing them to advance their entrance requirements or otherwise change their relations to the industrial classes which it is their special purpose to serve. The question of admission to the accepted list of the Foundation must, therefore, be taken up individually by the colleges with the officials of the Foundation. Elaborate discussion of this important matter may not appropriately be undertaken in this report. Dr. Henry S. Pritchett, president of the Foundation, has, however, kindly consented to address the association on the relation of the land-grant colleges to the Carnegie Foundation at a general session of this convention. At that time opportunity will be afforded for a general discussion of all the questions involved.

At the Baton Rouge convention of the association in 1906 the executive committee was instructed to consider the feasibility and desirability of holding occasional conventions of the association in connection with the annual meetings of the National Education Association. The committee is advised that the next meeting of the National Education Association will be held at Denver, Colo., in the summer of 1909. It may be well for the association to direct the executive committee to consider the advisability of holding the next convention in some appropriate connection with that meeting.

The first land-grant (or Morrill) act was approved by President Lincoln July 2, 1862. The Hatch Act was approved by President Cleveland March 2, 1887. The year 1912 will therefore mark the fiftieth anniversary of the first Morrill Act and the twenty-fifth anniversary of the Hatch Act. The committee are of opinion that steps should be taken well in advance to secure appropriate commemoration of these important incidents in the history of agriculture and of education in America in the year 1912, and suggest consideration of the matter by the present convention.

The treasurer's report will show the finances of the association to have been economically administered, all claims paid, and a considerable balance remaining in the treasury.

Respectfully submitted.

H. C. WHITE, *Chairman.*

## REPORT OF TREASURER.

The report of the treasurer was submitted by J. L. Hills, treasurer, as follows:

*Report of treasurer, May 28, 1907, to November 18, 1908.*

## GENERAL FUNDS.

## Receipts:

To cash on hand Lansing meeting-----	\$932. 54
To dues-----	1, 650. 00
To refund overpayment Hotel Downy-----	7. 50

Total -----	2, 590. 04
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Disbursements -----	1, 195. 28
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Balance in bank November 18, 1908-----	1, 394. 76
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## Classification of disbursements:

Executive committee-----	949. 98
Research committee-----	150. 22
Printing address President L. H. Bailey, as per order Lansing con-	
vention -----	69. 90
Secretary-treasurer -----	25. 18

Total -----	1, 195. 28
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## GRADUATE SCHOOL SUBSCRIPTION FUND.

## Receipts:

To cash on hand Lansing meeting-----	50. 00
To 29 subscriptions-----	725. 00

Total -----	775. 00
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## Disbursements:

Paid Cornell University-----	650. 00
Paid Cornell University-----	125. 00

Total -----	775. 00
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The treasurer's accounts were audited and approved by a committee appointed by the president, consisting of J. D. Towar, of Wyoming, and A. M. Soule, of Georgia.

## REPORT OF COMMITTEE ON GRADUATE STUDY.

This report was submitted by W. O. Thompson, of Ohio, in the absence of L. H. Bailey, chairman of the committee:

The entire activities of the committee on graduate study for the past year have been those that were devoted to the Graduate School of Agriculture held in July, 1908, under the auspices of the New York State College of Agriculture at Cornell University and the New York Agricultural Experiment Station. The report of the dean of the graduate school, submitted herewith, explains the details and sets forth the results. It remains for the committee only to express its convictions on points of general interest.

It is evident that the meaning of the school is becoming better appreciated by the colleges of agriculture. While the registration in the three successive schools has regularly increased and there is every reason to expect this increase to continue, yet it is the judgment of the committee that many of the institutions owe it to the cause of education to take more active and appreciative interest in the Graduate School of Agriculture. This school is setting standards and developing ideals. These standards should be propagated everywhere. They are capable of greatly increasing the effectiveness of education by means of agriculture and of extending its application. The committee thinks that every land-grant institution must accept the responsibility of furthering this enterprise. Moreover, it is also convinced that no land-grant institution can now expect to do the best work in education unless at least some of its staff actively participate in these graduate schools, and the administration

of the institution must also officially recognize the type of work for which the graduate school stands. If for no other reason, the colleges should feel the obligation of cooperating in these schools for the purpose of increasing the supply of available teachers of agriculture.

In short, the committee feels that the graduate-school idea is now established, and far beyond the experimental stage. All the land-grant colleges must now recognize it.

The committee is apprehensive that the very success of the graduate school may contribute to its defeat by making it the center for the meeting of great numbers of organizations. This tendency was apparent at Ithaca. It is no doubt desirable that organizations of teachers and experimenters meet at the time and place of the graduate school, but great care should be exercised to see that the programmes of these societies do not interfere with the regular educational work of the school.

The previous reports of the committee set forth the fundamental conceptions on which the graduate school is organized. The future development will be largely in the working out of the details. A great part of the success and effectiveness of the school has been due to the careful and able work of the dean, Dr. A. C. True, to whom the committee desires, in the name of the association, to express its cordial thanks.

The committee therefore recommends the continuance of this school, and asks for authority to make arrangements for a fourth session, to be held in the summer of 1910. It also urges that every college and separate experiment station included in this association find a way to contribute \$25 annually toward the maintenance of this school and make arrangements by which at least a portion of its staff may have an opportunity to attend each session.

L. H. BAILEY,  
M. H. BUCKHAM,  
R. H. JESSE,  
W. O. THOMPSON,  
BROWN AYRES,  
H. P. ARMSBY,  
*Committee.*

#### REPORT OF THIRD SESSION OF THE GRADUATE SCHOOL OF AGRICULTURE.

On the invitation of the committee on graduate study of the Association of American Agricultural Colleges and Experiment Stations, the undersigned accepted the offices of dean and registrar, respectively, for the third session of the Graduate School of Agriculture to be held in the summer of 1908. The committee accepted the invitation of the president and trustees of Cornell University, Ithaca, N. Y., and of the director and trustees of the New York Agricultural Experiment Station at Geneva, N. Y., to hold this session at those institutions.

When this was settled, plans were drawn for courses of instruction and for conducting the business of the school. These provided that the duties of dean and registrar, respectively, should be substantially the same as those officers had performed in connection with previous sessions of the school. The dean was to organize the faculty, make arrangements with its members for the work which they should individually undertake, and the registrar was to conduct correspondence and other business relating to membership of the school and make necessary local arrangements for housing the school, laboratory, and other facilities, and board and lodging of faculty and students while in attendance, etc. It was proposed that the session should cover four weeks, from July 6 to July 31, 1908, and that the routine work of the school should be done at the College of Agriculture at Ithaca, N. Y., with such occasional meetings at Geneva as might be found feasible.

The proposed programme for the session was broader than for the previous sessions, and included courses in biochemistry, agronomy, horticulture, plant physiology, dairy husbandry and dairying, poultry husbandry, veterinary medicine, and entomology.

The faculty was to include officers of the United States Department of Agriculture, members of the faculties and staffs of the agricultural colleges and experiment stations in the United States, as heretofore, and, in addition, one or two foreign authorities on subjects included in the programme and a few members of the faculties or staffs of scientific and educational institutions in the United States outside of the agricultural colleges.



This plan having been approved by the committee, correspondence with the proposed members of the faculty was at once taken up by the dean. This correspondence revealed the same difficulty which was experienced in making up the faculty for the previous session. A considerable number of persons invited to become members of the faculty were unable to serve because of the interference with other duties, and it was especially difficult to secure men who would consent to give any considerable number of lectures. Correspondence brought out the fact that there was much interest in this enterprise in a number of foreign institutions, and also in institutions in this country outside of the agricultural colleges. It should be said that the authorities and workers in Cornell University and the New York Agricultural Experiment Station did everything in their power to make the carrying out of the programme of the school a success. We also had the cordial cooperation of the honorable Secretary of Agriculture and the chiefs of the scientific bureaus of the Department of Agriculture. In the end it was found possible to assemble a strong faculty organized on broader lines than in previous sessions.

Announcements of the school were made by the registrar as follows:

Preliminary Announcement, 5,000 copies, sent out January 13; Prospectus, 5,000 copies, sent out May 6; Programme, 7,500 copies, sent out June 16. Copies of these are submitted herewith. To each dean and director of agricultural colleges and experiment stations was sent a package of these circulars, 500 to the National Department of Agriculture, and single copies were sent to the official bulletin list of the Office of Experiment Stations, scientific and other journals, and to miscellaneous applicants.

Announcements were also published in the Experiment Station Record, Science, and other journals, and copies were sent to the agricultural press.

The authorities of Cornell University put at the disposal of the school the large and well-appointed agricultural building which had recently been completed. This contained lecture rooms and offices, thoroughly equipped laboratories, and an assembly hall. The other buildings of the university, its library, farm, animals, experimental fields, etc., were freely opened to the inspection and use of the school. A stenographer was provided for the use of the dean and registrar and members of the school, and arrangements for board and lodging were made in the neighborhood of the university for from \$6.50 to \$8 a week. A headquarters for members of the faculty was provided at one of the fraternity houses in the immediate vicinity, where board and lodging were provided and payments made in lump sums by an officer of the university on behalf of the school. This proved an admirable arrangement, since it brought the members of the faculty into close relations with one another and did much to make their sojourn with the school agreeable and profitable.

The faculty included 61 men, of whom 16 were leading officers of the United States Department of Agriculture, 13 were members of the faculty of the College of Agriculture of Cornell University, 5 were members of the faculty of the New York State Veterinary College at Cornell University, 1 was a member of the faculty of arts and sciences at Cornell University, 5 were members of the staff of the New York Agricultural Experiment Station, and 21 were professors or experts from 17 other agricultural colleges and experiment stations, etc. There were also 18 men who gave one or two lectures or addresses in connection with the more general exercises of the school.

Included in the faculty were also Director A. D. Hall, of the Rothamsted Experimental Station; Prof. Dr. N. Zuntz, professor of animal physiology in the Royal Agricultural College of Berlin; Prof. L. B. Mendel, professor of physiological chemistry in the Sheffield Scientific School of Yale University; and Dr. C. B. Davenport, of the department of experimental evolution of the Carnegie Institution of Washington.

In addition to this, the school was attended by 144 men and 19 women, who may be classed as students. One hundred and thirty-seven persons paid the matriculation fees. In accordance with instructions of the committee, no fee was required of any member of the faculty of Cornell University or the staff of the New York Agricultural Experiment Station in consideration of the fact that honorariums were not to be received by members of this faculty or staff who lectured at the school. The total enrolled membership paying the matriculation fee was 119 from 36 States and Territories, 3 from the District of Columbia, 9 from Canada, 2 from China, and 4 from India.

There were also a considerable number of persons not registered who attended one or more lectures as visitors.

Meetings of the following organizations were held at the College of Agriculture at Ithaca during the session of the school:

American Society of Agronomy, Association of Dairy Instructors and Investigators, International Conference of Poultry Instructors and Investigators (this resulting in the formation of an association). The general convention of the Alpha Zeta fraternity was held in Ithaca during this period.

A number of persons interested in the problems of animal nutrition also had a conference and took preliminary steps toward the organization of an association to work with this subject. At these meetings subjects covering a wide range were discussed, and more than 100 persons outside of the membership of the school were brought into brief contact with the graduate school.

Within the period covered by the Graduate School of Agriculture a graduate school of home economics was held at the College of Agriculture under the general management of a committee of teachers of home economics. This was attended by about 25 teachers and other women from a number of different States. It was arranged that members of this school might also enroll in the Graduate School of Agriculture by the payment of a matriculation fee of \$5, inasmuch as they had already paid a like amount as a matriculation fee in the Graduate School of Home Economics. In this way a considerable number availed themselves of this privilege, and the two schools were thus brought into very close affiliation. A number of the members of the Graduate School of Agriculture attended some of the lectures at the other school, and addresses were given there by the dean and other members of the faculty of the Graduate School of Agriculture.

During the same period the summer session of Cornell University was in progress. This was attended by more than 800 students, many of whom were teachers. Through the courtesy of the director of the summer session, Prof. G. P. Bristol, arrangements were made by which students attending that session or the Graduate School of Agriculture were permitted to attend freely the general exercises of both sessions, which were usually held in the evening. In this way a considerable number of students at the summer session, especially teachers, were brought into close connection with the Graduate School of Agriculture.

The third session of the school opened promptly at 8 a. m. July 6, 1908, and continued four weeks. Instructors and subjects in the several courses were as follows:

#### BIOCHEMISTRY.

H. P. ARMSBY, Ph. D.

Selected chapters in stock feeding. Five lectures.

C. F. LANGWORTHY, Ph. D.

Physiological chemistry in relation to animal nutrition.

L. B. MENDEL, Ph. D.

Recent progress in the chemistry of the proteins, and its relation to the problems of nutrition.

The chemical processes of the alimentary tract.

Intermediary metabolism: Some aspects of the intermediary metabolism of nucleoproteins and purines; the intermediary metabolism of the carbohydrates; biochemical functions and protective mechanisms. Three lectures.

A. L. WINTON, Ph. D.

Microscopical methods for detecting adulterations in feeding stuffs. Five lectures.

N. ZUNTZ, Ph. D.

Aims and methods of research regarding the respiratory process. Two lectures.

The muscular action, its different forms and its influence on the quantity and quality of metabolism.

The different forms of internal labor performed by the resting organism and their influence on metabolism.

Influence of internal and external temperature on metabolism.

#### AGRONOMY.

M. A. CARLETON, M. S.

Rate of seeding.

Mixed crops.

S. M. WOODWARD, M. A.

Drainage of land for agriculture.

- R. A. EMERSON, B. A.  
Latent factors in heredity.
- R. P. TEELE, M. A.  
The arid region of the United States and its irrigation problems.  
Typical irrigation structures for the storage, diversion, and conveyance of water.  
The use of water in irrigation.
- A. D. HALL, M. A. (Oxon.).  
Special effect of fertilizers upon the character and composition of the crop.  
Special effect of fertilizers upon the reaction and texture of the soil.  
General discussion of the theory of fertilizers in relation to the soil and the plant.
- H. A. HARDING, M. S.  
Equipment of the investigator and his point of view.  
Growth of our knowledge of the bacteria in the soil. Early determinations of nitrification and symbiotic fixation.  
Results and problems in symbiotic fixation.  
Nitrification, its problems and methods for their study.  
Denitrification. General relations of soil organisms to problems of fertility.
- T. L. LYON, Ph. D.  
Methods of instruction and experimentation in field crops. Five lectures.
- E. G. MONTGOMERY, B. S.  
Methods of instruction and experimentation in field crops. Five lectures.
- W. J. SPILLMAN, M. S.  
Outlines of a course of lectures on farm management for college students. Three lectures.
- H. J. WEBBER, Ph. D.  
Mutations, their nature, production, and use in breeding.  
Is there a cumulative action in artificial or natural selection?  
Clonal or bud variations, their meaning and use in breeding.
- OSWALD SCHREINER, Ph. D.  
Constitution of soils.  
The analytical examination of soils.  
The soil solution and the minerals of the soil.  
Causes of infertility in soils.  
The rôle of manures in maintaining soil fertility.

#### HORTICULTURE AND PLANT PHYSIOLOGY.

- S. A. BEACH, M. S.  
Breeding the apple and the grape. Development, present status, possibilities, materials, and methods. Five lectures.
- L. J. BRIGGS, Ph. D.  
Measurement of environmental factors in relation to plant growth.  
Evaporation and its relation to other climatic factors.  
The influence of water vapor on the solar energy received on the earth's surface.  
The moisture equivalent of soils.  
The influence of acid or alkaline soil reactions on the development of fungus diseases in plants.  
Three lectures.
- B. M. DUGGAR, Ph. D.  
Plant nutrition and the relations of potassium, sodium, magnesium, and calcium.  
Nitrogen accumulation through fungi.  
The relations of plants to toxic organic substances.  
The ecological method in economic studies.  
The bearing of recent nuclear studies on the theory of heredity.
- U. P. HEDRICK, M. S.  
American viticulture: History, present status, botany, varieties, and improvement of American grapes. Five lectures.

- L. B. JUDSON, B. S.  
Effect of acetylene light on plant growth.  
Truck gardening on Long Island.  
The etherization of plants.
- G. H. POWELL, M. S.  
Fruit storage and transportation investigations. Four lectures.  
Cooperation in fruit marketing.
- W. T. SWINGLE, M. S.  
Scope and methods of plant life history investigations illustrated by recent work on the date palm and alfalfa.  
The law of the limiting factor in relation to variety testing and plant breeding.
- F. A. WAUGH, M. S.  
Landscape gardening. Five lectures.
- C. S. WILSON, M. S. A.  
The orchard survey of New York State.  
Some phases of grape growing in New York State.

## DAIRY HUSBANDRY AND DAIRYING.

- GEO. W. CAVANAUGH, B. S.  
Dried milk preparations.
- E. DAVENPORT, LL. D.  
Variability in cows.  
Influence of age upon milk production.  
Transmission of the milking quality.  
Difficulties in drawing conclusions from exposition breed tests.  
Selection for utility.
- T. L. HAECKER.  
The food of maintenance, variations and cause.  
Nutrient requirements in milk production.  
    (a) The composition of milk.  
    (b) The relation of digestible nutrients to milk solids produced.  
    (c) Feeding standard for milk production.  
Nutrient requirements in meat production.
- W. H. JORDAN, Sc. D.  
Nutrition of dairy cow. Five lectures.
- C. E. LEE, B. S.  
The Babcock and other tests used in butter making.  
Creamery methods.
- R. A. PEARSON, M. S. Agr.  
Modified milk.
- L. A. ROGERS, B. S.  
Butter flavors.
- H. L. RUSSELL, Ph. D.  
Conditions affecting distribution of bacteria.  
Standards of milk examination and their significance. Two lectures.  
General survey of recent progress in dairy bacteriology and general résumé of research work on this subject, with suggestions as to possible lines of future development.  
Methods of teaching.
- W. A. STOCKING, Jr., M. S. A.  
Fermented milk beverages. Two lectures.
- L. L. VAN SLYKE, Ph. D.  
The chemistry of milk in some of its relations to cheese. Two lectures.  
Progress in methods of making and curing cheese.  
Theories of cheese ripening.  
Methods of dairy investigation.
- E. H. WEBSTER, M. S.  
Development in the courses of instruction given for butter makers.  
Creamery records and accounting.
- H. H. WING, M. S. Agr.  
Relation of form to function (dairy score cards).  
Age and lactation as factors in milk production.  
Influence of body fat in making records.  
Influence of advanced registry on percentage of fat in milk.  
History of the development of a family of cows.



## POULTRY HUSBANDRY.

- C. B. DAVENPORT, Ph. D.  
 Origin of domestic fowl.  
 Characteristics of poultry.  
 General principles of heredity.  
 Application of principles of heredity to the breeding of poultry. Two lectures.
- P. A. FISH, Sc. D., D. V. M.  
 The digestive organs in poultry.  
 Digestion and nutrition in poultry.
- S. H. GAGE, B. S.  
 General discussion of the subject of reproduction: Origin and character of the male and female germinal cells; fertilization and segmentation. The growth of the hen's egg and the deposition of fat as shown by feeding Sudan III.  
 Structure of the oviduct in various stages of activity and the formation of the albumin, the shell membranes and the shell; double yolked eggs, eggs with two shells.  
 Formation of the germ layers, the tissue and organs.  
 Formation of the fetal membranes and the organs of sense. Monstrosities.
- WM. R. GRAHAM, B. S. Agr.  
 Recent developments in methods of incubation.
- G. S. HOPKINS, Sc. D., D. V. M.  
 Some points on the comparative anatomy of poultry. Two lectures.
- J. E. RICE, B. S. Agr.  
 Sequence in plumage and conditions influencing feather development in the domestic fowl.  
 The function of grit and the importance of ash in the feeding of poultry.  
 Vitality of the breeding stock as a factor in the successful handling of poultry.

## VETERINARY MEDICINE.

- J. W. CONNAWAY, D. V. S., M. D.  
 Texas fever and inoculation against same.  
 Practical demonstrations on methods and lines for further research. Three lectures.  
 Infectious diseases of swine.
- JAMES LAW, F. R. C. V. S.  
 Parasites and parasitism.  
 (1) Definitions. Divisions of parasites. Parasitic habit and effects, etc. Parasitic plants.  
 (2) Parasitic diptera.  
 (3) Ticks and mites, etc.  
 (4) Cestodes, trematodes and acanthocephali.  
 (5) Round worms.
- V. A. MOORE, B. S., M. D.  
 Methods of infection and the nature of infectious diseases.  
 Differential diagnosis with special reference to infectious diseases of animals.  
 The nature, channels of infection, and dissemination of animal tuberculosis.  
 A consideration of some fundamental principles in the production of immunity.  
 The diagnosis and control of bovine tuberculosis.
- W. L. WILLIAMS, V. S.  
 Hereditary diseases and defects.  
 Accidents and infections of coition.  
 Sterility.  
 Hygiene of pregnant animals.  
 Hygiene of the new-born.

## ENTOMOLOGY.

- E. P. FELT, Sc. D.  
 The work and systems in the office of the State entomologist.

S. A. FORBES, Ph. D., and J. W. FOLSOM, Sc. D.

The science and art of economic entomology as illustrated by a critical review of the work on the principal insects injurious to Indian corn. The subjects used will be—

- (1) The northern corn root worm (*Diabrotica longicornis* Say) and the southern corn root worm (*D. 12-punctata* Oliv.).
- (2) The Aphids of the corn plant (*Aphis maidi-radici* Forbes, *A. maidis* Fitch, and *Sipha flava* Forbes).
- (3) The common white grubs (*Lachnosterna* and *Cyclocephala* spp.).
- (4) The chinch bug (*Blissus leucopterus* Say).
- (5) A miscellaneous series selected because of their availability as illustrations of method.

A. D. HOPKINS, Ph. D.

Work of the Bureau of Entomology against forest insects.

L. O. HOWARD, Ph. D.

Recent developments in the practical handling of beneficial parasitic insects.

The present condition of economic entomology.

A. D. MACGILLIVRAY, Ph. D.

Methods and aids in entomological instruction.

J. G. NEEDHAM, Ph. D.

What shall be done with the marshes?

P. J. PARROTT, A. M.

Methods in planning and conducting cooperative experiments. Two lectures.

A. L. QUAINANCE, M. S.

Deciduous fruit investigation of the Bureau of Entomology.

W. A. RILEY, Ph. D.

Methods and aids in entomological instruction.

E. D. SANDERSON, B. S. Agr.

Publications of the State entomologist.

Methods of studying the codling moth.

M. V. SLINGERLAND, B. S. Agr.

Insect photography. Two lectures.

F. M. WEBSTER, M. S.

Investigations of insects injurious to grain and forage crops by the Bureau of Entomology.

Public exercises were held on the evening of July 8, when the school was welcomed to the university by Dr. J. G. Schurman, president of the university; and to the New York Agricultural Experiment Station by Dr. W. H. Jordan, director. A response to these addresses was made by Dr. J. L. Snyder, of the Michigan Agricultural College, as president of the association. Director L. H. Bailey, as chairman of the committee on graduate study of this association, presided and made an address. Dr. A. C. True, as dean of the graduate school, gave a short history of the school and stated its place in our system of agricultural education.

The special sessions devoted to conferences on general topics proved of extreme interest and value, especially to those actually engaged in the work of our colleges and experiment stations. These conferences included addresses as follows: "The Pedagogics of Agriculture," Dean T. F. Hunt, of the Pennsylvania College, and Prof. D. S. Snedden, of Teachers' College, Columbia University; "Defense Work of Agricultural Experiment Stations," Director E. H. Jenkins, of the Connecticut State Station, and Director W. H. Jordan, of the New York State Station; "Extension Work in Agriculture," President G. C. Greelman, of the Ontario Agricultural College, Prof. John Hamilton, of the Office of Experiment Stations, and Director L. H. Bailey, of Cornell University; "Editing of Station Publications," Dr. E. W. Allen, of the Office of Experiment Stations, and F. H. Hall, of the New York State Station; "Agriculture in Secondary Schools," Dr. E. E. Brown, United States Commissioner of Education, D. J. Crosby, of the Office of Experiment Stations, and Dr. G. F. Warren, of Cornell University; "Student Organizations," Director L. H. Bailey and M. G. Kains, assistant editor of American Agriculturist; "Elementary Instruction in Agriculture," Prof. William Lochhead, of Macdonald College, Canada, and D. J. Crosby; and "Rural Economy," Prof. H. C. Taylor, of the University of Wisconsin, Prof. G. N. Lauman, and Director L. H. Bailey. Considerable informal discussion followed the conferences and added much to their helpfulness.

One day of the session was occupied with an excursion to Geneva, where the buildings and equipment of the New York Agricultural Experiment Station were seen and its work explained by the director and members of his staff. A reception was given by Director and Mrs. Bailey at their residence in Ithaca to the faculty and students of the school. Numerous short trips were taken by classes and smaller parties to points of interest in the vicinity of Ithaca.

The following resolutions were adopted at a meeting of the students of the graduate school July 29, 1908:

"Whereas the third session of the Graduate School of Agriculture of the Association of American Agricultural Colleges and Experiment Stations, held at Cornell University, has been highly successful and of great benefit to those who have been in attendance, which benefits will be indirectly felt in every agricultural college and experiment station; and

"Whereas the results are in a large measure due to the generous efforts of the president and trustees of Cornell University in financing this session of the Graduate School of Agriculture, and to the cooperation of Dean A. C. True, Director L. H. Bailey, Director W. H. Jordan and his colleagues of the New York Agricultural Experiment Station, and to Registrar G. N. Lauman in promoting and administering the affairs of the school, and to the courtesy of the faculty of the College of Agriculture of Cornell University in providing facilities for the work and accommodation of the visitors: Therefore, be it

"Resolved, That we, the committee acting for the students of the Graduate School of Agriculture, hereby express our appreciation and gratitude to these gentlemen, personally, and to the institutions which they represent for their attention and courtesies.

"Adopted at meeting of the students of the Graduate School of Agriculture, July 29, 1908."

"R. A. EMERSON.

"M. G. KAINS.

"WALTER S. BROWN.

"W. LOCHHEAD.

"J. F. DUGGAR."

The increase in the number of courses proved successful, though the number of veterinarians and poultrymen in attendance was relatively small. The subjects discussed in the veterinary and poultry courses attracted a sufficient number of men interested in poultry and animal husbandry to make the attendance on these courses as a rule quite satisfactory. The poultry course was especially successful in the combination of scientific and practical subjects. The plan of having more general exercises, especially in the evening, was, on the whole, successful. Most of the addresses made at these conferences were appropriate to the graduate school and were listened to with great interest and followed by useful discussion. In a few cases the speakers missed the mark by going over matters with which their hearers were already familiar.

The plan of having lecturers from Europe and Canada, as well as from institutions in our own country outside of the agricultural colleges proved very successful. The men who came to us in this way not only did admirable service as lecturers, but also contributed much to the interest and success of the school by their personal contact with the faculty and students. The vital relations of general science to agricultural science in a number of lines were definitely brought out and the scientific outlook of our students was materially broadened.

The meetings of the various organizations held at Ithaca during the session of the school were well attended and aroused much interest and even enthusiasm. In some cases the programmes were overloaded and conflicted with the regular exercises of the school. The holding of such meetings during the session of the school should be encouraged, but there should be a more definite understanding that their programmes will be limited and that the hours of their sessions will not run parallel with those of the school.

In the number of students, in sustained interest, and in the breadth and thoroughness of the work this session of the graduate school was most successful. On the average, the students were more mature and experienced than at the previous session, and as a rule were well qualified to receive the instruction given them.

As was stated at the closing meeting of the session, "Probably never before has there been gathered together for so extended a period so large and enthusiastic a body of scientific men interested in agriculture."

The success of this session seems to show conclusively that there is a growing demand for the kind of instruction and stimulation which such a school gives. The association may therefore well plan and work for its continuance and improvement. It seems as if the time had come when our agricultural colleges generally should consider the Graduate School of Agriculture a permanent part of our system of agricultural education which they ought to encourage and support. If every college would make a definite arrangement by which several members of its faculty would attend each session, the school might easily have a considerably greater influence on the institutions included within the association.

*Receipts and expenditures on account of Graduate School of Agriculture, 1908.*

RECEIPTS.

From Association of American Agricultural Colleges and Experiment Stations-----	\$775. 00
From matriculation fees of students-----	1, 295. 00
From New York Agricultural Experiment Station at Geneva, N. Y.-----	275. 40
From New York State College of Agriculture, at Cornell University, Ithaca, N. Y.-----	1. 332. 43
Total-----	3, 677. 83

DISBURSEMENTS.

Honorariums for lectures, etc.-----	1, 660. 00
Traveling expenses and board of lecturers-----	1, 623. 44
Printing-----	245. 97
Labor and miscellaneous expenses-----	84. 63
Postage-----	63. 79
Total-----	3, 677. 83

Copies of the reports of the men who were locally in charge of the work in the different courses of the graduate school are submitted herewith, together with programmes and other documents relating to the school, and it is recommended that these papers be filed permanently in the Office of Experiment Stations.

A. C. TRUE, *Dean.*

G. N. LAUMAN, *Registrar.*

W. O. THOMPSON, of Ohio. There are some things in this report that I think the association ought to keep in mind distinctly. The report shows that 29 institutions or stations made contributions of \$25 to the maintenance of this school. The 29 contributions ought to be increased. We ought hardly to expect the local institution to pay so large a balance. Let me urge upon all the States to make the contribution if possible. I want to impress upon every college and station the value of this graduate school to the teaching forces and to the experimenters. The committee wishes to lay stress upon the importance of men making preparation in advance and working out problems that may be presented to this graduate school. The school has demonstrated its efficiency, its place in agricultural education, and that need not now be debated, but the committee wishes to emphasize the importance of the association making proper provision for its continuance.

The report was accepted.

MILITARY INSTRUCTION IN LAND-GRANT COLLEGES.

Maj. Gen. J. Franklin Bell, Chief of Staff, U. S. Army, on invitation of the association, addressed the convention, emphasizing the importance of utilizing military instruction at the land-grant colleges as fully as possible as an aid in preparing for national defense.



On invitation of General Bell, the delegates to the convention visited and lunched at the United States War College the day following the above address.

The thanks of the association were voted General Bell for his address and invitation and courtesies.

#### ADDRESS OF COMMISSIONER BROWN.

On invitation, Elmer Ellsworth Brown, United States Commissioner of Education, addressed the convention as follows:

It is a pleasure to have the opportunity of meeting with this body, and I am extremely sorry that the meeting of the Industrial Society, at Atlanta, calls me away this week, so that I am not able to avail myself of the privilege you have extended to me after to-day. I feel that the office I represent has some direct and immediate relations with your work, and consequently I may not be altogether out of place here. I should like, indeed, to count myself in a way as one of this body.

At the outset I want to thank the officers of these various agricultural and mechanical colleges for the courtesies that they have shown to the Bureau of Education in their responses to the inquiries that we have to send out in an official way from time to time. Occasionally we return the blanks that have been sent in for necessary correction. It is unavoidable that that should happen from time to time, but I am sure that you appreciate the spirit of cooperation in which even that is done when necessary, and I want to assure you that upon our side we appreciate the spirit of cooperation which you have shown, even when it has been necessary to carry on such correspondence.

The work of agricultural education can not be kept separate, and I do not think anyone in this body desires that it should be kept separate, from the great national work of education. It is of the utmost importance for all of us that our farmers should be educated as a part of the body politic, the body of American citizens, and not as a special class; and I hope that the time will never come when sharp lines of distinction will be drawn between the education of this class, or of any other class, and the education of the American citizens as a body. For we may be sure that if such line of separation is drawn as regards the farmer, it will be followed by similar lines of separation as regards other classes of our people.

I am extremely desirous, accordingly, that the Bureau of Education should do the work that is assigned to it in connection with the agricultural and mechanical colleges, in the way of promoting a good understanding, a good cooperation, between those who are engaged in education of all kinds in this country. It has been unavoidable that the functions of the Bureau of Education in this matter thus far should have been discharged in too mechanical a way, because of the absence of special resources for this purpose and because of the extreme narrowness of the general resources of this office. We have been able hitherto to do little more than simply carry on correspondence with reference to the regular reports and the distribution of the National funds to these institutions on the basis of such reports and to express our general good will; but we are making earnest endeavor to get such resources as will enable the National Office of Education to stand in an educational relation with these colleges and not simply in an official relation. I shall need your help in that effort, and I trust I shall have your help in getting such resources, in order that we may extend some sort of educational sympathy and support to you in your work.

The magnificent work that has been done by the Department of Agriculture in its relations with these organizations ought always to receive the highest recognition—not only the work that devolved upon that Department of necessity, and in a statutory way, but much more that that Department saw as a work needing to be done, and simply proceeded to do. Such work has been done by that Department in a most significant and useful way. I never miss an opportunity to express my admiration for what the Department of Agriculture has accomplished in this way. It has been one of the great emergency works of American education, and we see its results right here to-day in this organization. But after all the Department of Agriculture has done and will do, there still is a large work that should be done, of an educational character, by the way of furnishing a central office of communication between these colleges. Requests are coming up to the Bureau of Education from time to time for help upon sides of the work in these institutions which are not agricultural in character,

for help in the way of a comparison of methods and standards, particularly as regards engineering education in its various forms. The time will come, and the time will probably be not far distant, when there shall be just as good provision made at Washington for a central office for the distribution of information touching these matters as you have already as regards the purely agricultural sides of your work.

But it is not for me to make a speech at this time, but simply to bring these greetings, and express the hope that before very long we may be equipped in such a way that we can do more than simply express our good will, but we may be able to show that good will in more practical ways.

### EVENING SESSION, WEDNESDAY, NOVEMBER 18, 1908.

The meeting of the association was called to order at 8 o'clock p. m. by Vice-president E. A. Burnett, of Nebraska.

#### PRESIDENTIAL ADDRESS.

J. L. Snyder, president of the association, delivered the annual presidential address.<sup>a</sup> In this address President Snyder laid emphasis especially upon the relation of agriculture to other productive industries and the dependence of other industries upon agriculture. He pointed out that agriculture fosters a spirit of true democracy and develops character and provides conditions which are the true measure of the greatness of a nation. The growing needs of the future must be met by increased production by lands already under cultivation, not by increase of productive area. With the present rate of increase of population every State in the Union must practically double production within fifty years. Our democracy depends upon thus increasing production. Provisions for the maintenance of agencies for promoting agricultural production are therefore contributions to democracy, and this does not concern the farmer alone but every citizen of the Commonwealth. The scope and activities of educational agencies such as the agricultural colleges and the Department of Agriculture should be enlarged to meet the needs indicated. It is not only incumbent upon the agricultural college to enlarge its own courses in various ways, but to take the leadership in securing improved rural education and better economic conditions in general.

A vote of thanks was tendered President Snyder for his address, which was referred to the executive committee.

Later, at the recommendation of the executive committee and on motion of C. D. Woods, of Maine, the chair was authorized to appoint a committee, of which the retiring president was to be chairman, to cooperate with the Commission on Conservation of National Resources, as suggested in the address of the president of the association. The other members of the committee are C. R. Van Hise, of Wisconsin, and R. W. Silvester, of Maryland.

#### ADDRESS OF T. C. ATKESON, REPRESENTING THE NATIONAL GRANGE.

On invitation of the association, T. C. Atkeson, of West Virginia, representing the National Grange, addressed the association, expressing the hearty good will of the National Grange and its appreciation of the work the agricultural colleges and experiment stations are doing in this country.

When I think of all the great work that the colleges of agriculture and the experiment stations have done, and of what this organization of farmers themselves—the National Grange—has done toward helping to promote this work that the other institutions have been doing so well, I can not help feeling that the greatest force that has been behind this progressive educational era has

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<sup>a</sup> This address was published as Michigan Agricultural College Bulletin, 3 (1908), No. 4.

come from within rather than from without, and that the farmers, realizing the necessity of this more practical and more useful education, have themselves given it its impetus. This great organization, composed of about 1,000,000 of the most progressive farmers in the country, is largely responsible for the creation of the agricultural colleges and experiment stations, and certainly for the modernizing of the agricultural colleges.

The grange represents the true democracy of agriculture. Experiment stations look to the Government for their support. Agricultural colleges receive their maintenance from the States and the National Government; and so, in a large measure, they are not independent of other influences. The grange, a million strong, thoroughly organized, wears its own sovereignty under its own hat. It pays its own bills. It says what it pleases to say, in the presence of any body of men or in respect to any part of our citizenship or governing machinery. It is independent of outside influences or dictation, but with that independence it has tried to develop a sane and worthy leadership, a relation to the institutions of the country, especially those institutions that make for betterment of the rural homes of this country.

The agricultural colleges and experiment stations, along with these other influences that are instituted by the farmers themselves, are doing a work of tremendous importance in this country, and I am glad to be here this evening to bring to you the best wishes and heartiest good will of the grange and to inform you that this afternoon it unanimously adopted a resolution extending its courtesies and good will to your association and inviting you to be represented upon the floor of that association by a committee of one or more of your own members at such time as may suit your convenience. This body of men and women, constituting the National Grange, and representing nearly all the States in the Union, will be glad to receive your delegation and extend to them every courtesy possible on behalf of the farmers in thanks for the magnificent work you, through your several institutions in the various States of the country, are doing to promote the great agricultural interests of the country.

On motion, a committee of three, consisting of J. L. Snyder, D. W. Working, and H. T. French, was appointed to carry greetings to the National Grange. (See p. 49.)

J. L. Hills, of Vermont, for K. L. Butterfield, of Massachusetts, presented the following resolutions, which were referred to the executive committee:

#### RESOLUTION REGARDING DENVER MEETING.

*Resolved*, That it is the sense of the association that during the summer of 1909 the association should hold a convention on the Pacific coast or at some point in the far West; and further

*Resolved*, That we request the executive committee to consider carefully the feasibility of calling the convention for the week following the meeting of the National Education Association in Denver, in order that the members of this association may have an opportunity to participate in the National Education Association Convention, and particularly in the work of the department of agricultural education. (See p. 38.)

#### RESOLUTION REGARDING ANNIVERSARY CELEBRATION.

Whereas the fiftieth anniversary of the passage of the first Morrill Act and of the fundamental law under which the United States Department of Agriculture was organized and the twenty-fifth anniversary of the passage of the Hatch Act occur in the year 1912; and

Whereas it is the sense of this association that these anniversaries should be adequately recognized by a great gathering of those interested in all phases of agricultural education, and by the presentation of a programme comprehensive in scope covering the work of agricultural research, of instruction to students in colleges and schools, and of extension teaching; and

Whereas we believe that this meeting should have the support of the Government of the United States, and that the institutions of agricultural education in foreign countries should be invited to participate, as well as the representatives of agricultural education in this country; and

Whereas an appropriation from Congress will probably be necessary to carry out an adequate celebration of this character; Therefore be it



*Resolved.* That the association requests its executive committee to make a report to the association at the next annual convention on the practicability and scope of such a celebration, and on the need and amount of Congressional appropriation for the purpose. (See p. 38.)

At 10 o'clock p. m. the convention adjourned until Thursday, November 19, 1908, at 2 o'clock p. m.

### AFTERNOON SESSION, THURSDAY, NOVEMBER 19, 1908.

The convention was called to order at 3 p. m. by the president.

#### REPORT OF COMMITTEE ON THE HISTORY OF AGRICULTURAL EDUCATION.

The following report was submitted by A. C. True, chairman of this committee:

At the Lansing meeting of this association, "on motion of J. K. Patterson, of Kentucky, a committee, consisting of A. C. True, E. Davenport, and W. A. Henry, was appointed to take charge of the matter of a history of agricultural education." From the discussion on the motion to appoint this committee it appeared to be the desire of the convention that the collection of such data be undertaken at once, before the passing away of men who have been familiar with the agricultural education movement from the beginning, and that the Office of Experiment Stations be made a depository for historical data relating to this movement.

Acting for the committee, the Office of Experiment Stations sent out a circular letter dated September 20, 1908, to presidents and other members of agricultural college faculties, directors of agricultural experiment stations, and other educators and investigators who might be familiar with some facts concerning the history of agricultural education in this country asking them to aid the committee in one or more of the following ways:

"(1) By sending to the Office of Experiment Stations pamphlets, reports, letters, and other original documents which can be spared and which the owner wishes to donate to the historical collection of the United States Department of Agriculture.

"(2) By loaning the Office of Experiment Stations similar original documents which the owner does not wish to part with, in order that notes or copies may be made for the committee's use.

"(3) By sending the Office of Experiment Stations references to original documents which can not be donated or loaned, so that arrangements may be made to examine the documents.

"(4) By furnishing the committee with the names and addresses of men who are familiar with some steps in the early history of the agricultural education movement in this country and who can be consulted by the committee."

About 750 of these letters were sent out, and up to this time 146 replies have been received. Sixty-eight of these gave no information, 50 promised the committee something definite in the near future or gave the committee names of others to whom letters might be sent with a prospect of securing valuable data, and 28 gave definite information which will be of value to the committee in compiling historical statements.

The material sent in, together with historical data already in the possession of the Office of Experiment Stations, comprises a considerable number of historical pamphlets or clippings, early prospectuses and catalogues of existing agricultural institutions as well as of some early schools of agriculture which have been discontinued, copies of legislative acts, reports of investigating committees, memorials to legislatures, first editions of text-books, references to historical literature in different libraries, and some manuscripts.

At the request of the committee, the Specialist in Agricultural Education of the Office of Experiment Stations visited Dr. W. H. Brewer, of New Haven, Conn., and secured from him copies of several early lectures dealing with agricultural associations and containing numerous references to literature concerning these organizations, some notes concerning men who were prominent in the early development of agricultural education in this country, and copies of letters comprising about 100 pages of typewritten manuscript, written in 1894 to Prof. W. T. Hewett, of Cornell University, and dealing with the rise of agricultural

schools in the State of New York, the men who were prominent in this movement as well as in the movement for National aid to agricultural education, and incidentally with the origin and purpose of the land-grant act of 1862. This manuscript contains many references to reports, acts of Congress, and acts of State legislatures which will be of great value to the committee.

A visit was also made to Mr. Bronson Murray, of New York City, who was a farmer in central Illinois from 1843 to 1868, and was closely associated with Prof. J. B. Turner, of Illinois College, Jacksonville, Ill., with whom he became acquainted in 1852 and with him was instrumental in organizing the Industrial League of Illinois, the object of which was to influence legislation to aid instruction in agriculture and mechanic arts. Mr. Murray, although now 92 years of age, has a remarkably clear memory for early dates and facts in connection with the development of education in Illinois, and his recollections as related to the representative of the committee are of considerable interest. He had no way of knowing whether Professor Turner ever met Senator Morrill or influenced him in any way, either by correspondence or otherwise, but he believes that Professor Turner was the first man to agitate and advocate Government aid for industrial education in the different States.

The very fragmentary preliminary inquiry begun by your committee has not only resulted in bringing together some valuable historical data, but it has emphasized what was already well known to many, namely, the necessity of prosecuting this research vigorously from now on. The committee has the names of several very old men who should be visited at once. It has trace of a number of manuscripts and printed documents which should be looked up before they are destroyed or lost, and it has references to debates and legislation on the subject of agricultural education which will require considerable time to bring within reach of the committee either by correspondence or by personal research on the part of some representative of the committee, and it is a matter of considerable importance that at this time, when we are so rapidly projecting new enterprises in secondary and elementary instruction in agriculture, that a careful study be made of the many similar enterprises in agricultural education along the forties and fifties in order that the things which caused those enterprises to fail may now be avoided.

Your committee would therefore recommend that it be empowered to arrange with the Office of Experiment Stations not only to continue collecting data on the history of agricultural education, but also to employ some one to write a history of this movement, especially of those features of it which are long enough past to acquire historical perspective.

Each college may well aid in this enterprise by collecting data for its own State and forwarding this to the Office of Experiment Stations.

The report was accepted and the committee continued.

#### REPORT OF BIBLIOGRAPHER.

The following report was submitted by the bibliographer, A. C. True:

One of the large bibliographical questions of the day relates to the preparation, printing, and distribution of publications at public expense. The Federal Government is the largest distributor of such documents, but State governments, the land-grant colleges, and the State agricultural experiment stations are doing a great and constantly increasing business in this line. Many considerations of public policy are involved in the preparation, printing, and distribution of public documents. What kinds of documents is it proper for public institutions to prepare? Shall public documents be printed by private or public concerns? Shall such documents be distributed gratuitously or put on sale? How far shall the General Government extend the franking privilege to State governments or institutions?

Up to the present time there is no well-considered general policy of the Federal Government regarding public documents. Of late, however, there has appeared in both the executive and legislative branches of this Government a growing disposition to give some study to this matter. So far this has revealed itself chiefly in a realization of the importance of the problems and the burdens and waste involved in present methods.

It seems obvious that with the development of extension departments in the land-grant colleges and the consequent closer relations with the public schools and the masses of the people there will be a great expansion in the publishing

business of these colleges and that it will far outrun that now done by the agricultural experiment stations. It is therefore very important that the institutions included in this association should make a careful study of the problems relating to public documents as affecting their own interests. By so doing they may also contribute something of value to the broader discussion of policy regarding public documents generally, which is bound to come in the near future.

About thirteen years ago Congress took an important step toward a better system for the distribution of public documents by creating the office of superintendent of documents in the Government Printing Office. Though the legislation regarding this matter is very imperfect, that office has nevertheless demonstrated its usefulness and constantly increased its business. Of late it has come into close relations with the land-grant colleges, since their libraries are now depositories of government documents.

The nature of the duties of the superintendent of documents, and the possibilities for the development of the work of this office, as well as its relation to broad questions of policy regarding public printing and distribution of documents, are not well understood by our people generally, or even by the institutions most immediately affected by his work. It has therefore seemed to me desirable to give to this association, in lieu of my ordinary bibliographer's report, a brief account of the business of the superintendent of documents. And I can do this so well in no other way as to present to you the superintendent of documents himself, who has kindly consented to prepare and read a short paper which I desire to incorporate in the proceedings of the association as the chief item of the bibliographer's report.

#### ADDRESS OF W. L. POST, SUPERINTENDENT OF DOCUMENTS.

It is truly indicative of progress that a learned association such as this should invite remarks on the subject of "Public documents"—a subject which until recently has been shunned by the majority of those who labor in various ways to disseminate knowledge. It is gratifying to note this growing interest, as it will certainly prove erroneous the preconceived notions regarding the dryness and uselessness of the literature which Uncle Sam prepares and distributes, and when all unwarranted prejudice is superseded by an understanding of the true value of Government publications the documents will be more widely used and will be considered a valuable asset in a library, instead of the burden that they are, to many, at present.

Every year Government publications increase in number, volume, and usefulness. Bureaus which a few years ago were not known outside the Department to which they are attached have, by judicious publishing, brought themselves to the notice of the public, and exerted an influence over the thought of the age along the lines of their specialties. In this regard no Department has developed more rapidly than has the Department of Agriculture. In 1896 the total number of publications issued was 427, with 6,561,700 copies as a total, whereas eleven years later, in 1907, the aggregate number of publications was 1,415, in editions totaling 16,746,910; and you are doubtless aware that the Office of Experiment Stations contributed, in 1896, 74 publications, with a total of 1,136,850 copies, and, in 1907, 283 publications and 2,404,400 copies, to these totals.

You are, as a body, principally interested in agricultural subjects, but the publications of the Agriculture Department are so familiar to you that I am not going to allude to them further than to show that they represent the bulk of the books we sell and distribute.

I feel sure you are desirous of knowing what means and methods the Government is adopting to aid you in your great educational work, and shall therefore tell you of some of the difficulties which oppose the popularizing of these documents and of the history and work of the office which has to do with supplying the Government publications free to libraries and schools and by sale to individuals—the Superintendent of Document's Office, or the Public Documents Division of the Government Printing Office.

For many years prior to 1895 the distributing of Government books to libraries was accomplished through the Public Documents Division of the Department of the Interior, but the handling of the publications of one of the Executive Departments by another Department never worked harmoniously, and it was finally decided to transfer the work to a new bureau under the jurisdiction of the Public Printer. Accordingly, an elaborate plan for the establishment and



maintenance of the Office of the Superintendent of Documents was drawn up for insertion in a printing law then before Congress, a plan which, had it been enacted, would have fulfilled the hopes of document experts and established the methods of distribution on a firm basis for future development along economical lines. But, alas, this very essential portion of the bill was placed upon the altar of sacrifice to the great legislative god Compromise, and in its final form was almost unrecognizable to its framers and promoters, and presents as illogical an enactment as was ever placed upon the statute books.

It was the original purpose to establish, convenient to the Government Printing Office, a central distributing agency for *all* public documents, in order to avoid extra handling of the vast number of publications annually issued therefrom. In this office were to be consolidated the many distributing agencies, thus making it possible to detect and prevent duplication in shipments, and, if properly equipped, provide an easy means of compiling records for use in obtaining needed legislation in the future. So it was proposed that this new officer, the Superintendent of Documents, should have general supervision of all Government publications, and that to his custody should be consigned all documents printed for distribution. But, as a result of the conciliatory amendments, those publications printed for use of Congress, the Executive Departments, and the independent publishing offices were excepted from the operation of this provision, virtually leaving the Superintendent of Documents in control of the distribution of only such publications as he himself should issue and those which by law were intended for depository libraries. But centralization in distribution must come, and with it will be solved the great questions which are now so vexed and difficult of solution.

At present the Superintendent of Documents distributes the books furnished by law for the use of 1 library in each Congressional district, to be chosen by the Representative from that district, and 1 library in any part of a State or Territory to be named by each Senator, Delegate, or Congressman at Large, which libraries are known as "designated depositories." There are also lists composed of 4 libraries similarly designated in each district, to which the current issues of the publications of the Geological Survey are forwarded, and of 8 libraries in each district named as recipients of the weekly issues of the Official Gazette of the Patent Office.

To those libraries constituted designated depositories we ship periodically 1 copy of each and every public document printed, except those considered confidential or strictly official in character. It is easily seen that this privilege is a valuable one to a library which can afford to take care of the books sent, but a burden to one unequipped for the work. It is in the proper selection of these libraries for the placing of collections of Government publications that I am anxious to interest this association. We have on our lists now some 487 such libraries, out of a possible 615, and I doubt if the full number will ever be designated, as it is a question whether there are that number among the 9,000 libraries in the country able or willing to assume the responsibilities of depositories. In the course of a year each designated depository library receives on an average from 900 to 1,000 books and pamphlets, which will occupy in bulk at least 50 feet of shelf space. It is no small problem properly to classify and make available such a quantity of material, covering subjects ranging from agriculture to astronomy, and treating of them in bulletins, circulars, monographs, and reports of the most technical nature.

At a recent session of Congress, regardless of strenuous opposition and the exhibiting of the baneful results of such an action, a law was passed constituting all of your land-grant colleges designated depositories. Of the 67 libraries notified of the conferring of this great privilege, 15 declined to accept the honor, and 2 have since requested to be dropped from the list, finding no use for the major part of the material forwarded. I have no doubt that many of the others are alike desirous of discontinuing the books periodically sent, as they are not permitted to select that class of literature which would be of service to them. The theory of depositories involves the placing conveniently throughout the country complete sets of Government publications for the use of the people; but even after many years of annual expenditures of over \$100,000, the designated library, as the depository of a complete file of Government publications, is but a theory still.

No greater good could be wrought in library economy in the various States than a movement looking to the proper location of these depositories and the obtaining of legislation making them permanent, instead of leaving them subject

to change at the whims of Members of Congress. If permanently designated after careful selection, valuable and useful collections could be built up, where now are scattered, unclassified, and unused sets.

Another problem which presents itself for solution, and which is second only to that of the proper location and privileges to be granted to the depositories, is whether gratuitous distribution or sale is most advisable in distributing public documents. Perhaps it is too radical to suggest the total abolition of the practice of gratuitous distribution, but I would almost prefer to run the risk of doing an injustice to a few earnest collaborators than continue to incumber unoffending libraries or waste valuable printed matter on unappreciative constituents.

It has been demonstrated by practical experience in the past few years that the restriction of the free distribution to libraries, institutions of learning, and collaborators does not lessen the interest of the public in the publications, but increases it. I would advocate selling all books at a nominal figure, just enough to cover the cost of production and distribution, which under correct conditions should be comparatively small. With careful advertising and keeping customers informed of new publications, not only a more logical, but a less expensive, distribution would result.

Print all the useful matter you can compile for the benefit of the farmer; take pains to notify him of its publication; provide him with an inexpensive and easy means of remitting for the purchase of the books desired; centralize the now numerous agencies from which publications and information are obtained, and ways and means will have been provided for reaching more who would be actually benefited than can ever be reached through the free and fitful methods now in vogue.

In 1896 our office sold 21,363 Government publications; in 1906, 74,806, while the annual report for 1908 will exhibit 211,897 copies disposed of. Of the latter figure 94,626 copies were Agriculture Department publications—nearly as many as the entire sales for 1896 and 1906 combined. It is our desire and aim to popularize public documents, and their increased sale is largely due to our efforts to make them known. The general routine of Government official life gives little time or opportunity for the application of those "follow-up" and custom-catching methods found so profitable in the business world, but the Superintendent of Document's Office has only two purposes in life, namely, to collect and catalogue the publications as issued, and to make them known and supply them to those who may desire to obtain them.

In fulfilling the first part of our mission we have collected the most complete file of United States Government publications in the world, a collection which is used as the basis for all our cataloguing and reference work. We compile a Monthly Catalogue, which lists all current issues of the month covered; a complete index to the numbered publications of Congress, which is issued at the close of each regular session of Congress; and the great Document Catalogues which appear every two years, and contain the permanent record of everything published during that period. These catalogues are free to libraries, but it is an astounding fact that out of an edition of 2,500 copies of the Monthly Catalogue, only 1,128 are distributed, though the publication has been offered free by sending sample copies to every library in the country.

But what is the use of writing books, publishing, or cataloguing them, unless you make them known and available to the people? Had this question been asked and answered years ago, the congestion of 3,000,000 publications, two-thirds of which were either superseded by later editions or rendered obsolete by age, would never have embarrassed a Superintendent of Documents. But the making of books, of which there truly is no end, continues; the size of editions once established remains the same; and without knowledge where best to place the copies published, the publishers retain them undisturbed. What a shameful waste of energy, time, and money.

We have done our best to assort the vast accumulation now on hand; have made known through the medium of a Free List those which were available for library distribution; have put into our stock over a million good and useful books; obtained permission to dispose of a greater portion of the remainder by sale as waste paper; and procured legislation permitting the printing of allotments in editions as needed to prevent overprinting and a repetition of this wasteful accumulation.

We are printing and circulating Price Lists and Leaflets to your libraries, to our customers, and to specially selected lists of names, in the hope of disposing of our great store of older publications, as well as those of current interest. We are advertising in magazines and daily papers and displaying in



the post-offices throughout the country a neat list of important publications available by purchase, a list entitled in large letters "Government Documents for the People." We are sending this also to your schools and libraries, and asking you to give it prominence and bring its contents to the attention of your students.

Our reference force is answering hundreds of letters a day, giving references to particular subjects and informing persons who apply how to obtain the desired publications by sale or where they can consult them in a near-by library.

Careful consideration is given every customer to locate him on the list which will insure his receiving notice of future publications in which he might be interested, and this is all done because we are anxious to circulate, instead of accumulate, public documents.

We want all the libraries, colleges, and schools to understand that we stand ready to assist them in procuring either the information contained or the public document itself; that our services to them are entirely free and willingly bestowed, as are also the books when in stock; and that their interest in our methods and their friendly cooperation are what we need in order to continue to develop our plan of a clearing house for Government publications and a bureau of information regarding their contents.

I cordially invite you all to visit us in our new and commodious quarters in the annex building, adjoining the Government Printing Office, and solicit your patronage in the future for growing reciprocal benefits in another broad field of educational extension and experiment.

The report was accepted and placed on file.

#### REPORT OF COMMITTEE ON INSTRUCTION IN AGRICULTURE.

This report was submitted by the chairman, A. C. True.

Since the meeting of this association at Lansing May 28, 1907, the committee on instruction in agriculture has revised and published a tentative secondary course in agronomy, and its subcommittees on rural engineering and domestic science have been engaged in collecting data to furnish the basis for reports setting forth somewhat definitely what these subjects should include in the four-year college course.

The subcommittee on domestic science has prepared a tentative syllabus for a four-year college course in this subject, which has been submitted to the committee as a basis for further study and investigation, with the understanding that the subcommittee will work out the details of this course so far as now seems practicable, and that then the course will be printed in confidential form and submitted to prominent teachers of domestic science in the different States for criticism and suggestions before being put into final shape for publication as a report of this committee.

This subcommittee is confronted with many difficulties, owing to the fact that educators are as yet far from being in accord concerning even the main features of a college course in subjects relating to the arts and sciences of the home. There is as yet no substantial agreement as to whether the college course should include the manual features of courses in domestic art and domestic science, or whether this work should be relegated to the high schools.

The subcommittee on rural engineering submitted a preliminary memorandum, which is substantially as follows:

#### PRELIMINARY MEMORANDUM ON FARM ENGINEERING.

Instruction in farm engineering may have two quite different ends in view, viz:

(a) To provide a practical working knowledge of the ordinary mechanical operations of the farm.

(b) To prepare the student for a professional career in some field of engineering applied to agriculture.

The former may be a proper part of a course in agriculture; the latter constitutes a special engineering training. The committee has to deal with the former only.

The relative place of the subject of farm engineering as above defined in a course in agriculture is a subordinate one, since the average undergraduate student in such a course does not look forward to undertaking extensive or difficult mechanical or engineering operations, and can not afford to devote a con-

siderable part of his college course to this subject. He can not expect in pursuing such a course to become a skilled mechanic or architect or engineer. If he is to undertake work on a larger scale involving such knowledge, he will wish to intrust it to an expert. It is sufficient that he understand practically the operation of standard machines, the use of building materials, the construction of fences, roads, and farm water and drainage systems, and how to make a simple drawing. A fair working knowledge of the principles involved can be had in a course occupying about two two-hour periods weekly for one school year, or sixty hours. The subject should be administered chiefly as a practicum consisting of laboratory exercises, demonstrations, and observations. In the absence of any comprehensive single text-book the student should obtain certain standard works for present and future reference, but the course should not be administered chiefly from text-books. The following is an outline of topics to be considered, subject to modification to meet local conditions:

*Drawing.*—(Some knowledge of drawing prerequisite.) Plotting, building plans, details of construction.

*Roads.*—Observations and discussions of types of road construction, study of local road materials available, and their adaptability and use.

*Machines.*—Cultivating, harvesting, and grinding machines, motors, pumps. Comparison and handling of typical machines of these classes.

*Materials of construction.*—Uses, adaptability, and defects of cement, lumber, roofing materials, brick, stone, and metals.

*Hydraulics.*—Water supply, drainage, and irrigation.

It is not expected that all the topics here included will necessarily be taught in this course in any institution, but that the choice of topics will be within the range here indicated. In order to offer the student additional training in different branches of the subject, short elective courses in these branches may be given with special reference to the requirements of particular regions.

In the hands of a competent instructor, who should prepare the exercises carefully in advance in order to save the student's time, and who makes use of local examples for observation of various matters to be studied, sixty hours distributed as above indicated will impart to the student a fair knowledge of good practice as distinguished from bad and will enable him to perform many important mechanical operations of the farm. It is not the purpose of such a course to multiply practice for the sake of imparting skill, that is to be pursued by the individual as he may desire, but rather to indicate to him how and why certain things are done. Beyond this it is not the purpose of such a course to go.

A more detailed outline of the courses suggested above is given below as a part of this report.

ROADS.	{ Locating and laying out. Selection of materials. Construction. Maintenance.	{ Instruction given by means of lectures, discussions, and observations on types of road construction and their adaptability to different localities as determined by the problems of construction, the availability, cost, and durability of materials, and the cost of maintenance.
FARM MACHINERY.	{ Principles of mechanics as applied to farm machinery. Classification. Plows. Surface working machines. Seeding machines. Harvesting machines. Food preparing machines. Farm vehicles. Small implements. Farm motors. { Steam. Gasoline. Alcohol. Water. Wind. Horse. Man. Operation. { Principles. Practice.	

Review very briefly the principles of mechanics as applied to types of cultivating, harvesting, and grinding machines, and farm motors; handle and compare typical machines in each class; study principles of operating and caring for them.

MATERIALS  
OF CON-  
STRUC-  
TION.

{ Lumber.  
Roofing materials.  
Brick.  
Stone.  
Cement.  
Metals.

{ Study uses, adaptability, and defects of these materials in constructing houses, barns, silos, piggeries, poultry houses, fences, and other farm structures, also modern, approved methods with reference to economy of labor and materials in construction; and the principles of sanitation and economy of time and labor in the work of the home, the care of animals, and the disposition of waste.

HYDRAULICS.

{ Water sys-  
tem. { Springs.  
Wells.  
Reservoirs.  
Pumps and other water  
lifts.  
Conduits.  
Tanks.  
Plumbing.  
Sewage system.  
Drainage. { Open drains.  
{ Covered drains.  
Irrigation.

{ Some attention should be given to the supply and use of water on the farm, and to the disposal of surplus water and sewage. Whether irrigation is to be studied at all will depend upon whether it is practiced in the region.

It will no doubt be of interest to the association to know what use is being made of the different reports of the committee on instruction in agriculture. It should be explained in this connection that the Office of Experiment Stations, which has published all of these reports, does not maintain a large list of names to which all of these reports are sent. It has a small selected list of institutions and men who, because of their official relation to instruction in agriculture or because of personal requests upon their part, have been put upon the agricultural education list of the Office, which now includes about 3,300 names. So that the original distribution of these reports has not been much above 3,000 copies, and several of them were published at a time when the agricultural education list did not include over 2,000 names.

With this explanation, the committee submits the following memorandum concerning the distribution of its reports:

Circular 49, Secondary Courses in Agriculture, has been published in four editions, with a total of 12,000 copies, 11,000 of which have been distributed.

Circular 60, The Teaching of Agriculture in the Rural Common Schools, has been published in five editions, with a total of 24,000 copies, of which 22,500 have been distributed.

Circular 69, A Four-Year College Course in Agriculture, which embodies the first five and the eighth reports of this committee, was first published in 1906, since which time 3,000 copies have been published and 2,500 distributed.

Circular 77, A Secondary Course in Agronomy, has been published in two editions, with a total of 8,000 copies, 7,000 of which have been distributed.

Bulletin 127, Instruction in Agronomy at Some Agricultural Colleges, was published in one edition of 5,000 copies, of which 4,900 have been distributed.

Bulletin 186, Exercises in Elementary Agriculture—Plant Production, has been published in four editions with a total of 22,000 copies, of which 19,000 have been distributed.

Bulletin 195, Simple Exercises Illustrating Some Applications of Chemistry to Agriculture, has been published in two editions of 15,000 copies, of which 10,000 copies have been distributed.

The total distribution of the reports of this committee, not including the separate distribution of its first five reports and its eighth report, has been 76,900 copies, and this distribution has come about very largely as a result of actual requests for the committee's reports or of sending out copies of these reports

in reply to inquiries which could better be answered by sending these reports than by writing letters.

A. C. TRUE,  
H. T. FRENCH,  
H. C. WHITE,  
J. F. DUGGAR,  
W. E. STONE,  
T. F. HUNT,  
*Committee.*

The report was accepted.

#### REPORT OF COMMISSION ON AGRICULTURAL RESEARCH.

David Starr Jordan, president of Stanford University and chairman of the commission on agricultural research, was presented by the president of the association and read the report of the commission.<sup>a</sup> The commission, consisting of David Starr Jordan; W. H. Jordan, of New York; H. P. Armsby, of Pennsylvania; Gifford Pinchot, of this Department; and Carroll D. Wright, of Massachusetts, was appointed at the 1906 convention of the association "to inquire into and report to the association the organization and policy that in the opinion of the commission should prevail in the expenditure of public moneys provided for scientific experimentation and research in the interests of agriculture, to the end that such funds shall be applied in the most economical, efficient, and worthy manner to the production of results of permanent value." The report presented (1) a statement of present conditions affecting the efficiency of agricultural research, taking this term to mean "the scientific investigation of unsolved problems that have a direct or indirect relation to agricultural practices or conditions," and not "academic or popular instruction or agricultural propaganda;" and (2) a series of recommendations which, in the opinion of the commission, "should guide in the promotion, organization, and prosecution of research in agriculture."<sup>b</sup>

At 5.35 p. m. the convention took a recess until night.

#### EVENING SESSION, THURSDAY, NOVEMBER 19, 1908.

The convention was called to order at 8 p. m. by President Snyder.

##### PLACE OF NEXT MEETING.

The resolution of K. L. Butterfield regarding the next meeting of the association, already given on page 29, was taken up and, after some discussion, referred to the executive committee, as were invitations by W. J. Kerr and R. W. Thatcher to hold the next convention at Portland, and by L. G. Carpenter in behalf of Denver.

##### ANNIVERSARY CELEBRATION.

A second resolution by President Butterfield, relating to the anniversary celebration of the establishment of the land-grant colleges and the experiment stations in 1912, was taken up for consideration.

On motion of Secretary Hays, the resolution was amended to include the celebration of the fiftieth anniversary of the establishment of the United States Department of Agriculture and adopted.

<sup>a</sup> The report has been published in pamphlet form by the association.

<sup>b</sup> See Experiment Station Record, vol. 20, p. 301.



## REPORT OF COMMITTEE ON EXTENSION WORK.

This report was submitted by C. F. Curtiss, of Iowa, for K. L. Butterfield, chairman of the committee.

Your committee desires, first of all, to emphasize with all possible vigor the pressing need of organized work at the agricultural colleges of this country, by means of which the colleges may more completely reach the working farmers. It is true that the dissemination of information about agriculture has been carried on for many years by the agricultural colleges and experiment stations, and that it has been of untold value in stimulating our agricultural production and enlarging our country life. Our former reports have shown that this work is widespread and is assuming large proportions. Nevertheless, your committee is free to assert that the present scope of dissemination work among farmers is entirely inadequate. There are tens of thousands of farmers who do not take agricultural papers; probably not 1 farmer in 25 ever attends a farmers' institute; there is a comparatively small amount of consecutive study of agricultural literature among farmers; there is need of more effectively reaching the young farmers at home and in the rural schools. As a plain matter of fact, we are not to-day, either directly or indirectly, reaching the great masses of the tillers of the soil with educational processes that may be regarded as even fairly efficient. We are doing a large work, but we are not doing work that fully meets the problem. We must go to the farmers in their homes and communities—they will not come to us. We must show the farmers how—the farmers who do not read agricultural literature nor attend farmers' institutes.

Furthermore, the work of disseminating agricultural information is at present not only inadequate in amount, but it is also desultory and unorganized. There is no State in the Union that has a thoroughgoing system of extension teaching, compactly organized, adequately manned, covering the working forms of extension teaching, and designed actually to reach out a hand to the larger proportion of the men and women and youth of the farms. Your committee believes that the time has come when this problem should be met squarely, and that steps should be taken at once by all our colleges to organize properly equipped departments for this type of work.

It is hardly necessary to argue that work of this kind is one of the functions of the agricultural college, whether a separate institution or a branch of a university. The agricultural college is the natural source of information about new things, the natural clearing house for the knowledge of the best practices in agriculture. Therefore extension work in the agricultural college is logical.

Furthermore, the people themselves are beginning to demand a larger amount of extension work. They are asking for help. They wish to be led to new levels. So that this type of work in an agricultural college is inevitable.

Extension work in the agricultural college also gives point to experimental work and, indeed, invigorates resident instruction, because contact with the real problems of the working farmer and with the great issues of country life vitalizes the work of research and inspires instruction. Thus extension work performed by an agricultural college is at once logical, inevitable, vital.

Your committee desires, therefore, to repeat the substance of two recommendations made in its report last year and two years ago, neither of which recommendations has been acted upon by more than a very few of the institutions belonging to this association. These recommendations were substantially:

First. That each college represented in this association organize, as soon as practicable, a department of extension teaching in agriculture coordinate with other departments or divisions of the agricultural work, with a competent director in charge, and, if possible, with a corps of men at his disposal.

Secondly. That in case any college is not prepared to take this step immediately, it should appoint a faculty committee on extension teaching in agriculture, which should make a thorough investigation of the desirability and feasibility of organizing in that particular college at an early date a recognized department of extension teaching.

We would like to call renewed attention to these recommendations, and ask the members of this association if the time has not arrived when this great work should be properly recognized in the administration of the institutions belonging to this association.

We desire to record our belief that extension teaching should, at the very beginning, be put on the broadest basis, and that in the work of the extension

department of the agricultural college there should be fully recognized the economic and social phases of agriculture, and also that great untouched field for educational work—home life on the farm. We will never reach the heart of the rural problem until we at the land-grant colleges and experiment stations are prepared to be of assistance to the farmers and their families along the higher reaches of their own lives.

We believe that this association should definitely recognize the place of extension teaching in the scheme of agricultural education. The men at present in charge of extension work in the various States are beginning to feel the need of coming together to discuss the problems which are already of mutual interest, and are coming to have the belief that their work should be more fully recognized by us. They have already called an informal meeting to discuss their problem. They feel, and feel rightly, that their task is an organic part of the institutions here represented. Your committee therefore recommends that this association take the proper steps to organize a permanent section of this association, to be known as the "section on extension work."

Your committee in its first report made a brief preliminary survey of the various means of disseminating agricultural information now in vogue in this country. In the second report there was given a somewhat careful résumé of the extension work performed by the land-grant institutions of the United States. In preparing both of these reports your committee had, and acknowledged, the substantial assistance of the United States Department of Agriculture, through its Farmers' Institute Specialist, John Hamilton. Your committee still believes that there should be a much more exhaustive study than has yet been made of methods of extension teaching in this country and abroad. We also believe that the United States Department of Agriculture can assist in organizing and developing extension work without in the slightest degree robbing the States of their proper and effective initiative in this work. It is our impression that the Department of Agriculture at the present time does not have an appropriation for the use of the Farmers' Institute Specialist adequate for the purpose either of acquiring information or of developing illustrative material and methods. We believe, therefore, that for the sake of encouraging extension work itself, Congress should appropriate a much larger sum than it now appropriates for the purpose named.

It is the belief of your committee that the chief means of stimulating the proper recognition and adequate organization of extension work in agriculture in our land-grant colleges is a Federal appropriation for the work. We are quite aware of the objections that may be made to this proposition—that we already have too much Federal supervision; that the Federal Treasury is inadequate to the demands made upon it; that it is becoming too easy to rush to the Federal Government whenever money is desired for any public purpose; and that initiative should be left to the States. But there are fundamental reasons, so it seems to your committee, why we have a right, and, indeed, a duty, to ask Congress to appropriate money for this purpose. Extension work in the land-grant colleges differentiates itself sharply from research work on the one hand, and from the instruction of resident students on the other. There is little chance for argument upon the proposition that the organization of resident instruction in agriculture through the Morrill and Nelson acts and the organization of research and experimentation through the Hatch and Adams acts is chiefly responsible for the progress in agricultural education that has been made during the past few decades. It is true that a few individual States had recognized their obligations and opportunities before any of these acts were passed. But what brought these types of work into well-organized form, and what put them upon a substantial foundation, was the Federal appropriation. We can think of no argument that has ever applied or does now apply to Federal appropriations for agricultural colleges and experiment stations that does not equally apply to extension work, which is organic and vital in the development of the functions of the institutions which we represent.

We would not advocate a large appropriation for this purpose. We would suggest that the proposed law should make an appropriation of, say, \$10,000 a year from the Federal Treasury to each land-grant college for the purpose of carrying on extension work in agriculture, and that the act be so framed that, after this appropriation has been made, there shall also be an appropriation, based on some per capita standard, made to the same institutions for the same purpose on condition that the States themselves appropriate equal amounts. Thus we would have effected a stimulus for well-organized extension work in every land-grant college in the United States. State initiative would



not be destroyed, but rather stimulated. It would remain with the States themselves to determine how far they would care to go. In any event it would not be a heavy drain on their own treasuries.

May we call the attention of the members of this association to what is, perhaps, a fanciful idea, but which is also a rather suggestive one? In 1862 the Federal Government made its first munificent grant to the agricultural colleges. In 1887, twenty-five years later, it established its first formal aid for research and experimentation, which has revolutionized our agriculture and our agricultural education. May there not be some point in the plea that, by the time another quarter century has rolled around, we should see another Federal appropriation for this third great phase of agricultural instruction which must be performed by agricultural colleges—extension work? When we come to celebrate in 1912, as we ought, the fiftieth anniversary of the passage of the first Morrill Act, and the twenty-fifth anniversary of the passage of the Hatch Act, shall we not also be able to rejoice in the fact that there has been made and that there is in operation a fairly liberal Federal appropriation which shall stimulate and direct the energies of our agricultural colleges in an endeavor to carry out to the great masses of our farmers some of the privileges and inspiration and knowledge that originate in the stations and colleges?

A practical suggestion of a minor nature, although one that is really important, is that the Federal Government should extend the franking privilege to the land-grant colleges for publications which are not primarily advertising in character. It is a well-known fact that many of the bulletins of the experiment stations are not reports of experiments, but are monographs or compilations. These publications are franked. Your committee believe that what is now done practically should be done avowedly. The United States Department of Agriculture also has the privilege of franking any form of publication. One factor in the successful development of extension teaching must be the larger dissemination of printed information, and this can hardly be done unless the franking privilege is granted to the extension departments of the land-grant colleges.

Your committee does not wish to rest under the imputation of having presented a report which shall seem to lay down the scope of operations of future committees, but there is one phase of the work of this committee which has impressed itself so strongly that we feel it incumbent upon us to state our views on the subject.

During the past year your committee has given considerable study to three fundamental considerations with respect to the development of extension teaching. The first is an outline of the field of extension work, including the definitions of terms and a description of the forms of work; the second is the administrative organization of the work, both within the institution and with respect to the field machinery; and the third is the relationships of the extension work in agriculture at the land-grant colleges to other agencies for the popular dissemination of agricultural information and to other educational institutions. These three lines of thought, together with a minute and special study of the manifold methods of carrying on extension work, are, in the judgment of your committee, subjects for the most careful study of this standing committee in the future. This is peculiarly true of the subject of the relationships of extension work. We do not believe that there can be a thorough appreciation of the function of extension teaching unless we understand its place in the general scheme of agricultural education. We must determine its relationships to the work of the experiment station, to the work of college instruction, to the short courses of the college, to the work of other colleges, universities, and normal schools, and to secondary schools of agriculture, to the voluntary organizations and enterprises, such as the agricultural press, the grange, the various agricultural associations, and the rural work of the Young Men's Christian Association, etc. What shall be its relation to the United States Department of Agriculture, to the various boards of agriculture, to the work of the various State bureaus and commissions? It is exceedingly important that the function of our great system of farmers' institutes to the general scheme of extension teaching shall be considered, and if possible decided.

In the judgment of your committee, these are not academic questions. They go to the very root of the purpose and character of extension teaching. They are fundamental considerations. The members of your committee have given some attention to these questions during the past year. They have tentatively formulated their views and have come to a substantial agreement. For various reasons it seemed best at this time to present for your consideration a few

definite recommendations, which we believe to be the basis for the early organization of this work in all of the institutions belonging to this association. At the same time we believe thoroughly that there should be a comprehensive study of these larger phases of the work. Only by the assistance of the United States Department of Agriculture can this committee hope to make a proper study of the details of methods. Some progress can be made in the near future in outlining the work of extension departments, and perhaps in defining terms. As soon as the departments of college extension are actually organized the questions centering about administration will become pressing and will need the attention of your committee. But it is perhaps chiefly in the realm of the relationships of extension teaching that especial care should be exercised. Your committee therefore recommends to the association that there be appointed a joint commission, organized in some such manner as the commission appointed to study the relationships of the agencies doing research or experimental work in agriculture, to study the fundamental relationships of the institutions and agencies designed to disseminate agricultural information among the people; or, if this does not seem best to the association, we urge strongly that your standing committee on extension work be given specific authority to study this subject and to report upon it at some future time.

Your committee, in closing, wishes to summarize their present recommendations as follows, presenting them to the association for such action as may be deemed wise:

(1) We recommend that each institution represented in this association organize as soon as possible a definite scheme of extension work in agriculture.

(2) We recommend that the association organize a section of the association to be known as the "section of extension work."

(3) We recommend that the association favor increased appropriations for the United States Department of Agriculture for the purpose of making investigations into all phases of the work of disseminating agricultural information, and of assisting the States in every practicable way to organize the work under the best auspices.

(4) We recommend that the association place itself on record in favor of a moderate Federal appropriation to be made to the land-grant colleges for the purpose of carrying on extension work in agriculture under a plan which requires the States also to make appropriations for the work.

(5) We recommend that the association request Congress to extend the franking privilege to bona fide extension publications issued by the land-grant colleges.

(6) We recommend either the appointment of a joint commission representing the various agencies interested to report upon the proper relationships of the extension work in agriculture to be carried on by the land-grant colleges to other agencies and institutions performing a similar service; or, if the association think it a wiser plan, we strongly urge that specific authority be granted by the association to this standing committee on extension work to make a study of this subject and to report on it at a future meeting of the association.

As a final word, may we once more express our firm belief in the fundamental importance of an immediate organization of extension work in agriculture under the auspices of the land-grant colleges. We are convinced that the most pressing need in the development of our agricultural industry, and in the enlargement of our country life in America, is the wider diffusion of the knowledge we already possess. Shall we longer delay to render that full service which will be so far-reaching in its effects?

Respectfully submitted,

KENYON L. BUTTERFIELD,  
CHARLES R. VAN HISE,  
CHARLES F. CURTISS,  
ANDREW M. SOULE,  
W. M. HAYS,  
W. C. LATTA,

*Committee.*

Sections 1 and 3 and the last part of section 6, beginning "we strongly urge," were approved. Section 2 was postponed indefinitely. Sections 4 and 5 were, after debate, referred to the section on college work and administration as required by the constitution in case of administrative matters, and were not again reported to the convention.

D. W. WORKING, of West Virginia. Regarding the matter of the recognition of the extension work, I wish to call attention to one consideration that is worth thinking about, perhaps, between now and the next meeting. In my own State the extension department was only recently created in the college of agriculture in the university. Very shortly afterwards the State board of agriculture created an extension department under another name. I wish to call attention to the fact that that action is in line with the disposition in other places on the part of boards of agriculture and commissioners of agriculture, who undertake a portion of the instruction work which the extension men in the colleges think belongs by right of organization to the extension department in the college, and the question that arises in my mind is whether the discouragement of the advances that have been made by your committee will not encourage boards of agriculture to attempt to preempt ground that ought to be occupied by the colleges.

In favoring the indefinite postponement of section 2, W. H. Jordan, of New York, said:

I do not want our friends interested in extension work to feel in any sense offended because they think that work is not receiving definite recognition. We laid the foundations of the reorganization of this association at our meeting at Atlanta. We cut out every section excepting two, a college section and a station section, and the point of view then prevailing was this—and I am simply recalling history in order that we may be consistent—that it is unwise to divide our deliberations so much. Now, we have just adopted a recommendation that the colleges organize extension departments. If that is done, the presidents of the colleges will be profoundly interested in that matter, and the station directors to an extent, and I believe these matters that have to do with public relations and general policies should be discussed before all the members of each section, and that as soon as we divide we shall lose force and interest.

C. F. CURTISS, of Iowa. I realize that there are two sides to this question, and I realize the force of what Doctor Jordan has said about our present organization. I think it has been eminently satisfactory, greatly to be preferred to the old plan, but the conditions have changed, and we find it necessary to revise our plans and methods. At the time the present plan was formulated we had no such work as organized extension, and I think our present plan provides no means by which the extension work may properly come into the programme. It provides, for instance, in the section on station work, that two main topics, and only two, shall be taken up at each session. One of those topics shall relate to some question bearing upon research work, and the other shall be of a nature bearing upon the administrative work. That plan is all right as far as it goes, but there is no provision by which we may bring in a discussion of the extension work, and the extension work is becoming vital; it is becoming very important in its relations to the college instruction work and its relation to the research work, and in the future the work of the land-grant colleges is going to take the three natural forms or divisions. Whether we want it or not, the extension work is coming in, and it is going to demand a part of our time and a part of our consideration. We recognize that under the constitution this change can not be made at this time. It would necessitate an amendment to be offered to the constitution at this time and to go over for consideration until the next annual meeting. Such an amendment will be offered at this time, regardless of what disposition the association may make of this recommendation to-night, because I feel that this is coming, even though there must necessarily be some overlapping, just as now there are questions discussed in each section which are of interest to the membership of the other section. This extension work will naturally occupy an important place in the



plan and work of the colleges. If it is not provided here, it will naturally form an alliance with the farmers' institute work. Instead of letting part of the work that naturally and legitimately belongs to the colleges drift away to another organization, we ought to strengthen our organization and hold it here. I believe it will be wise to take this matter under consideration for a year at least, and then do as the judgment of the association dictates in regard to forming a new section at the next meeting when this amendment to the constitution comes up.

C. E. THORNE, of Ohio. I just want to say that we have in Ohio a college of agriculture which has already organized an extension department. We have an experiment station which has already organized its extension department, and I had hoped to see the time when the discussion of extension work with reference to the work of the experiment stations might be had as one of the administrative questions in the section on experiment station work.

H. C. WHITE, of Georgia. May I call attention to the fact that the constitution provides that each section may create such divisions as it may from time to time find desirable? There are complications that will arise in creating a new section that will not arise in creating a new division.

W. J. KERR, of Oregon. Is it not true that farmers' institutes form a very important part of the extension work in agriculture? We have now an organization promoting the farmers' institute work. As has already been suggested, this farmers' institute organization meets about the time of the convention of this association, preceding this meeting this year, and is it not possible that all of the work relating to extension in agriculture should be done in connection with the farmers' institute organization? Another word in connection with that. It seems to me that the question as to whether or not we want a number of additional sections or divisions of this association will be determined by a consideration of a question of policy. It seems to me that our purpose here in this organization and in the experiment station section or the college section is rather to consider important questions of policy than to enter upon a consideration of details. In other words, we do not meet here as an institute for training farmers' institute workers, or people engaged in any line of extension work. It does seem to me entirely appropriate, at any of the meetings of this association, to have papers, discussions, and reports relating to the important work of college extension. Certainly we are very much interested in this work at the Oregon Agricultural College, where we are organizing it for the State, and I do not think it advisable to establish a special section of this association for the extension work.

#### PROPOSED AMENDMENT TO THE CONSTITUTION.

C. F. CURTISS. I desire to offer the following amendment to the constitution, to go over, under the rules, until the next annual meeting of the association. At the end of paragraph 1, under the head of "Sections," add the following: "(c) A section on extension work."

I merely desire to say that I feel that this matter ought to have further consideration, and this will permit it to be brought up, and if there is a better solution of the question than the creation of a new section the association will have it in its power to make that solution. I feel that it is imperative that we provide for the extension work in some form.

The PRESIDENT. This notice will go over until the next annual meeting.

#### ELECTION OF OFFICERS.

The following officers were chosen for the ensuing year: President, M. A. Scovell, of Kentucky. Vice-presidents—first, W. J. Kerr, of Oregon; second,

C. E. Thorne, of Ohio; third, H. T. French, of Idaho; fourth, W. D. Gibbs, of New Hampshire; fifth, A. B. Storms, of Iowa. Bibliographer, A. C. True, of Washington, D. C. Secretary and treasurer, J. L. Hills, of Vermont. Members of the executive committee—from the section on college work and administration, J. L. Snyder, of Michigan; W. E. Stone, of Indiana; W. O. Thompson, of Ohio; from the section on station work—W. H. Jordan, of New York; C. F. Curtiss, of Iowa.

The following nominees for officers of the sections were confirmed: College section—chairman, P. H. Mell, of South Carolina; secretary, W. J. Kerr, of Oregon; programme committee, the chairman and secretary of the section. Station section—chairman, P. H. Rolfs, of Florida; vice-chairman, E. J. Wickson, of California; secretary, F. B. Linfield, of Montana; programme committee, the chairman and secretary of the section and E. H. Jenkins, of Connecticut.

M. H. BUCKHAM, of Vermont. In presenting the nominations on the part of the college section I took occasion to express in the name of the association our sense of great indebtedness to the chairman of the executive committee for the last half dozen years. It has been suggested to me that what I said as a member of the college section should be said to the general association. I will not repeat in terms what I said at that time, but I am very glad to be again the mouthpiece of what I know to be the mind of the whole association with reference to our feelings toward Doctor White and to say that the committee did not leave his name out by their own choice, but at his urgent request and insistence for reasons which have been satisfactory to him and were, as he presented them, satisfactory to the committee. Far and away, it seems to me, the most important office of this association is the chairmanship of the executive committee, and we have been very fortunate in those who have held that office. There was Major Alvord, who had great ability in turning out executive work rapidly and accurately. There was President Goodell, who seemed to love every important work which would have been drudgery to most men and which he did with extreme pride; and for the last half dozen years we have had the services of a man of very rare accomplishments, personal and official, a man who without any friction or without any possibility of giving offense to anybody has often had occasion to override or overrule the wishes of the members, who, I think, have always assented to his disposal of the business; a man to whose gracious personality and persuasive speech this association has been indebted on many occasions for success before different bodies, before committees of Congress, before trustees of the Carnegie Foundation, and on many other occasions. He has, with apparent ease to him, done work which most of us would have dreaded—undertaken to persuade these committees and these bodies to grant favors to this association. The only thing which tempers, to my mind, and I am sure to your minds, our loss in the retirement of Doctor White, is that he has assured the committee and assured all of us that he will still give to the association his service in any way and at whatever time he may be called upon.

W. H. JORDAN. What I shall say now, what has been said, are not eulogies on a departed member. He will still be with us and will continue to be a leading force in the efforts and in the policies of this association, but I feel that it is entirely fitting that a long-time associate of his in the executive committee should say just a word.

I want to bear testimony to the tactful and gracious consideration he has always given his associates in that committee. I believe we know, as scarcely any of the rest of you do know, how delicately and successfully he has handled delicate questions in various places, and if you were to recount in your minds



the steps of progress that have been taken by this association and the institutions here represented during the past years and the number of difficult questions that have arisen between us and Congress, and between us and other bodies, I think you will then recognize the distinguished service that this gentleman has rendered. The chairmen of our executive committees have been in a peculiar sense the builders of the policies and success of the institutions in this association, and Doctor White is the peer of any chairman we have had; and I wish in closing to express my sense of regret that he feels it is incumbent upon him to no longer intimately associate himself with this work.

C. F. CURTISS. As a colleague of Doctor White's and a member of the executive committee for several years past, I wish also to say to the association that he has been always keen and alert, clever and tactful, courteous and efficient, as we all know him to be, and that he has rendered to the association eminent service in the capacity in which he has served, and I trust the association may continue to draft him to service in important tasks that may come before it.

On motion of C. D. Woods, of Maine, the convention, by rising vote, showed its appreciation of the services of Doctor White as chairman of the executive committee.

H. C. WHITE. I am sure it is needless for me to say that I am very much touched by this expression of confidence and respect on the part of the association as a whole, more particularly by the more than kind words that have been used by those with whom I have been particularly associated—Doctor Buckham, Director Jordan, and Director Curtiss—in the work of the executive committee in the association. Of course, I know and feel that I have done simply what I ought to have done, what any man would have done who had been in my place. It so happened, my conditions were such, that I could serve the association in this post, which is arduous and which requires a man who can respond at a moment's call to the service of the association. I say, it has so happened, I was so situated, that I could do it promptly and without very great sacrifice to my personal interests. I am more than grateful that during my incumbency of this office great questions have arisen affecting the interests of this association, affecting the interests of the institutions forming this association. I am more than grateful to feel the conviction and consciousness that those questions have been settled wisely, settled well. I retire from this office, of course, with feelings of affectionate friendship for every man with whom I have been brought in association in this organization. You have all been most kind to me, as you have to each other—courteous and gentle and considerate always. I am not parting either with the organization or with the work in which it is embarked. My relations in my institution have been changed by my own volition and in obedience to what I consider the better interests of that institution. I am personally no sufferer; I am not proposing to go on the Carnegie Foundation, or to retire from active service, and I shall be glad at all times to place my services at your command.

#### AFFILIATION OF AGRICULTURAL ORGANIZATIONS.

H. J. Waters, of Missouri, offered the following resolutions, which were adopted:

*Resolved*, I. That this association heartily approves of the proposed affiliation of the various existing societies and associations organized for the consideration of subjects relating to agricultural science, with a view of bringing all such efforts into greater harmony and efficiency;

II. That a committee of three be appointed to consider the relation that this association should sustain to the proposed affiliation; and

III. That this committee be instructed also to confer with the representatives of other organizations with regard to the formulation of a plan of affiliation.

The committee appointed by the president in accordance with these resolutions consists of H. J. Waters, of Missouri, chairman; T. F. Hunt, of Pennsylvania; and H. J. Wheeler, of Rhode Island.

#### ANNUAL DUES.

On motion of J. L. Hills, of Vermont, the dues of the various institutions were, as usual, fixed at \$15 for the ensuing year.

#### ENGINEERING EXPERIMENT STATIONS.

The executive committee was instructed to promptly and carefully give attention to the bill before Congress for the establishment of engineering experiment stations.

#### CARNEGIE FOUNDATION.

The association, by vote, expressed its sense of the desirability of continuing endeavors on the part of the association in relation to the Carnegie Foundation for the Advancement of Teaching, and requested H. C. White, of Georgia, to act as its representative in that matter.

#### RESOLUTION REGARDING TARIFF ON BASIC SLAG.

W. P. Brooks, of Massachusetts, offered the following resolution, which was adopted:

Whereas basic slag, which under the tariff act now in force is classified with metals and their manufactures and made to pay a duty of \$1 per ton, is largely imported and used as a fertilizer in some parts of the United States; and

Whereas it would seem to belong to the tariff schedules with fertilizers rather than with metals, since its only use is for manurial purposes; and

Whereas such diverse substances used as fertilizers as apatite, ashes, dried blood, bone dust and bone ash, guanos, kelp, kieserite, kainit, oil cake, crude phosphates, nitrate of potash, sulphate of potash, muriate of potash, and nitrate of soda are all included in said tariff schedules in the free list, while moreover one paragraph under said free list ends with the phrase "and all substances used only for manure:" Therefore be it

*Resolved*, That since it is the plain intent of the tariff act now in force to foster American agriculture by the admission free of duty of all materials of manurial value, this association urges upon Congress that basic slag be classified with fertilizers under the free list and that the duty of \$1 per ton at present levied be removed at the earliest possible moment.

At 10 p. m. the association adjourned until Friday, November 20, 1908, at 9 a. m.

#### MORNING SESSION, FRIDAY, NOVEMBER 20, 1908.

The association was called to order at 9 a. m. by President Snyder.

#### REPORT OF COMMITTEE ON STATION ORGANIZATION AND POLICY.

After announcement of the appointment of the standing committees (see p. 7) the report of the standing committee on station organization and policy was submitted by C. D. Woods, for E. Davenport, chairman. This report has already been published by the Office of Experiment Stations.<sup>a</sup>

The following resolution recommended by the committee was adopted:

Whereas the Office of Experiment Stations is the official avenue of communication between the Federal Government and the experiment stations of all the States; and

Whereas the funds administered through this Office now amount to something over a million and a half dollars; and

Whereas both the dignity and the magnitude of the interests involved are inconsistent with an "office" organization: Therefore, in further confirmation of the action taken by this association at last convention, be it

<sup>a</sup> U. S. Dept. Agr., Office of Experiment Stations Circ. 82.

*Resolved*, That the executive committee be instructed to use all appropriate means to secure the elevation of this Office to the dignity and compass of a bureau in the Department of Agriculture.

COMMITTEE TO WAIT UPON THE PRESIDENT-ELECT OF THE UNITED STATES.

The following resolution was adopted :

*Resolved*, That a special committee of five be appointed by the incoming president of the association to represent to the President-elect of the United States, by memorial or otherwise, the interest which this association properly entertains in the administration and work of the United States Department of Agriculture, in view of the intimate relations necessarily existing between that Department and the institutions represented in this association, and to express to him its confident hope that under his administration those relations may be even more cordial and mutually helpful than in the past.

The committee appointed in accordance with this resolution consists of L. H. Bailey, of New York, chairman; H. C. White, of Georgia; C. R. Van Hise, of Wisconsin; T. F. Hunt, of Pennsylvania; and L. G. Carpenter, of Colorado.

PLACE OF MEETING OF THE NEXT GRADUATE SCHOOL OF AGRICULTURE.

An invitation to hold the next graduate school at St. Anthony Park, Minn., was presented by T. L. Haecker, of Minnesota.

Assistant Secretary W. M. Hays favored this selection with a view to a joint meeting of the association and the American Breeders' Association, and said :

The most weighty reason, I think, for going to Minnesota is this: That this great movement for secondary agricultural education, at present focused about the Davis bill, is probably best exemplified by two schools—one the school at St. Anthony Park and the other the county school at Menomonie. Should the Davis bill pass at this session or the next, which is possible, there would no doubt be a great many of the younger men preparing for work along that line who could be brought together in the graduate school and get the point of view, the details of the work in relation to the high schools and in relation to the college men.

I do not arise to enter into any discussion particularly about the Davis bill, but I do wish to mention at this time one or two of its provisions, particularly as they affect lines of work to which I have been giving special attention in the Department, viz, plant breeding and, broadly speaking, farm management. Plant breeding is a long-time proposition. It means, I believe, a business establishment separate from mere research in breeding in every State in the Union. It has as its economic goal something like 10 per cent of addition to the products of our farms at a cost of approximately 1 per cent. So far the cost in many lines of plant breeding has been one-tenth of 1 per cent, but when it comes to spread out over the country we may estimate it approximately at 1 per cent. That is, \$1 of public money will help the people, without other particular expense, to produce \$100 more, and this seems to me a conservative estimate. The Davis bill will provide demonstration farms not only for the Department and the stations, but for schools and small colleges. It would provide permanently endowed experiments in each State, under State ordinances, which could be developed with a continuity of purpose that is absolutely necessary in breeding field crops, horticultural crops, and animals. We have left to the counties of England largely the production of the creative breeding, the breeding of the animals we are using. Some of us have been trying to devise a plan which would put the creative breeding under the direction of the Department and bring them into cooperation with groups of farmers who would use large numbers. This seems to be absolutely necessary in order to preserve local breeding centers and prevent the comparatively few very best breeding animals from being bought out of a neighborhood by wealthy men and dissipated in the great mass of live stock. In many cases this local breeding work could be centered at these branch stations, and these stations organized into breeding circuits. This animal-breeding circuit plant is in its infancy. It has been started in Minnesota, North Dakota, and a few other places. It has started under difficulties, but those who have charge of it assure me that the promise is good, that there is no serious difficulty to overcome. This matter of three or four hundred branch experiment stations, permanently located, partly for



scientific work, would make a broader basis for our experiment stations to carry out these two lines of work.

Farm management experiments form another work of large scope, requiring long-time tests of fertilizers, rotations, etc. We need, in the different localities of this country, much more extended opportunities to do this line of long-time plat work, and these stations can mostly be located so that they will be on the great types of soil.

The Davis bill would add a considerable sum to the funds of the State experiment stations. It would look very large as compared with the fund now provided for the State stations. It does not, however, look so large as compared with the funds that are being added, not once in ten years, but annually, to the Department of Agriculture. This would furnish one of the best opportunities for the Department and the stations to cooperate in thoroughly planning lines of investigation running, in many cases, from twenty to fifty years, or even longer. I think it is one of the great opportunities we have to increase production.

Under the Davis bill we are going to have 20,000 or 30,000 consolidated rural schools which will be like high schools of the lower high-school grade, as I trust, and leading up to high schools of higher grade, thus in a measure securing for the farmer his proper proportion of the total budget of appropriations for public purposes.

An invitation to hold the next graduate school at Ames, Iowa, was presented by A. B. Storms, of Iowa.

The invitations were referred to the committee on graduate study for consideration.

#### NATIONAL GRANGE.

The committee appointed to carry to the National Grange the felicitations of the association reported briefly through H. T. French, chairman, that it had discharged the duty assigned to it and had been cordially received by the grange.

#### CARNEGIE FOUNDATION.

Dr. Henry S. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching, was presented to the convention by H. C. White and made an address, of which the following condensation was furnished for publication in the proceedings:

The Carnegie Foundation, which has now within its disposal some \$16,000,000. is endowed not only as an agency for the establishment of a retiring allowance system, but as a power in the direction of work in higher education. The retiring allowance system is only one of the many avenues of work on which the Foundation may enter. It is the first and principal work, and probably will be the principal work for some time to come. In administering this system it quickly became evident that to elevate the condition of the teaching body in America a retiring allowance system must be such that men come under it as a right, not as a matter of vote by a board of trustees; under fixed rules, not under an uncertain arrangement. The Carnegie Foundation realized that its business was to deal with institutions, not with individuals; to say what institutions are eligible by reason of the work they are doing, by reason of the standards which they are upholding, and by reason of their relation to the system of general education in their respective States; and that once an institution is declared eligible its professors shall receive retiring allowances under fixed rules, exactly as they receive their salaries. To carry this idea into administration, the practice of the Foundation is to pay the retiring allowance in such a recognized college not directly to the professor, but into the treasury of the college.

This being the basis of the retiring allowance system, the Foundation was frankly brought to the consideration of what is a college. It found, approximately, 1,000 colleges in the United States, Canada, and Newfoundland. By what rules should these colleges be admitted to share in our endowment? Should we say that all institutions are colleges which call themselves so and attempt no educational criterion with respect to what is the work of a college? That would have been to throw away all educational significance from



the Foundation. So we were driven to the effort to discriminate between these 1,000 colleges. At the outset of our operations we had to study the organization of colleges in English-speaking America. And, of course, we had to consider college organization from the standpoint, not of a single institution, nor even of a great State, but from the standpoint of a continent. This is, I think, the first agency which has undertaken to examine American colleges in Maine, California, Florida, Colorado, in the Provinces of Canada, and in the colony of Newfoundland. Whether our work turns out to be wise or not, it seems to me worth while to have such an agency with such a point of view.

In discriminating between the 1,000 institutions chartered as colleges we have assumed that in order to be truly a college or to be truly a technical school in the sense of higher education an institution must articulate with the standard high school. But in order to serve the people of its State a college should not articulate with the standard four-year high school, unless that high school is a reasonable prerequisite for the kind of education the people wish to obtain. In other words, a college ought to place itself squarely upon the educational system of its State, and if that educational system includes the four-year standard high school, then the Carnegie Foundation can recognize the college as an institution of higher learning. On the other hand, although by our charter the Foundation can not recognize as an institution of higher learning a college which is not thus based upon the standard four-year high school, a lower standard may be the only wise course for an institution owing either to the nature of its work or to the condition of the community it is its duty to serve. For a college to attempt to put itself upon the top of a four-year high school, unless this course was justified by the interests of the people of the whole State, would be an educational crime.

The question, therefore, both for us and for you, is whether the agricultural and mechanical colleges supported from the land-grant donations are essentially institutions of higher education. There are really three kinds of these agricultural colleges. First, there is a small group of institutions, like the Massachusetts Institute of Technology and the University of Vermont, which are institutions upon private funds governed by self-perpetuating trustees, but which received a share from the original Morrill grant. This group need concern us little. The Morrill fund played but a small part in their development. Second, there is the group of State universities to which the Morrill grant was given for a separate college of agriculture within the university organization; and third, there is the largest group of those institutions founded under the Morrill Act, supported in part by it, which undertake to furnish a course in agriculture and a course in what is ordinarily called the "mechanic arts."

The question of the comparative wisdom of these last two types of organization, whether it were wiser to make the college of agriculture a part of the State university, or whether it were wiser to organize the college of agriculture as a separate college, is a question which has already been practically settled in every State. There are advantages and disadvantages in both solutions. To have all the institutions of higher learning of a State brought into one great institution is a certain advantage from the standpoint of power and of the lack of duplication of work. It also avoids the tendency to pit one part of the State, which has the agricultural and mechanical college, against another part, which has the State university, in the attempt to secure favorable legislation. Also, I am inclined to think that when a college of agriculture is made a department of a State university, it is more likely to attend to the business of agriculture and nothing more. The college of agriculture and mechanical arts has tended to become a school of engineering, with an agricultural feature added. For this there is a pedagogical reason—the teaching of engineering was already systematized when these institutions were established; it was pedagogically a simple thing to teach engineering. That is what mechanic arts came to mean. It did not mean teaching the work of a farmer or of a mechanic; it came to mean engineering, and from this it came to pass that there has been a tendency in the separate college of agriculture to develop along the lines of an engineering college.

On the other hand, the separate college of agriculture has certain advantages. In any institution of learning we seek to separate incongruous phases of education. That is why we separate the high school from the college and the college from the university. We do this because experience has shown that we can not put incongruous phases of education—phases which seek to deal with men of very different preparation and men of very different aims—into one institution as successfully as we can into different institutions.

Agriculture has certain duties, certain needs, certain opportunities which are distinctive, which belong to it, which do not fit together with what we have come to consider the work of a university. This gives the separate agricultural college its great advantage. Take, for example, entrance requirements. It is not at all clear to me yet that the entrance requirements for a student of agriculture ought to be the same as the entrance requirements for the ordinary college student. That question is an open one. I find, in looking over the agricultural and mechanical colleges, their curricula, their work, their catalogues, and in visiting some of them, that the variation of their entrance requirements is much greater than the variation of entrance requirements in the State universities. Some of you have entrance requirements quite equal to those of the colleges of New England; some of you have entrance requirements which do not necessitate one year of the standard high school. In other words, there is a wide divergence amongst yourselves as to what your duty is in education, of what your purpose is. You have not yet brought about in your own conception, so far as I can understand it, any uniformity as to what your mission is, as to what your work is, as to what your relations to education are to be. This is exactly what the Carnegie Foundation desires to know.

I do not mean by this emphasis on entrance requirements that a college or university may deal only with the students who have regularly matriculated. A college which limited itself to that sort of teaching with a great body of men would be an extremely limited institution; a college which followed that policy ought really to adopt the business nomenclature of such-and-such a college, limited. But an institution which sets itself up to be a college and to print in its catalogue a list of 600 students, of whom 475 are in farmers' courses, and in various courses for six weeks, does not, in my judgment, come up to the standard college which I allude to. You should make it clear to the people who come, to the public, to all who have to do with your constituency, that the extra work, however useful, however desirable, however important, is not college work. By all means do the work, but make it clear that only those are college students who come up to a certain standard; that the others are what the Germans call "hospitanten."

The Foundation not only wishes the agricultural colleges to make clear to us what their field of education is, but also what is their relation to the general educational system of their respective States and regions. It is not enough for a college to say, "We put up our standard to a four-year high school." I would say to that college, "What arrangements have you made to have your men prepared for your college after you have put it up on these stilts? Where are the schools that are to prepare students for the college? What sort of relations do you have with these schools?" We can not too often bring before our minds that the educational system of our State is one, not a set of unrelated, separate schools.

Then, finally, we ask you if you wish to come into relations with us, that in the establishment of your standards, concerning which, of course, we have nothing to say, that you make clear to us that the standards shall be real ones. A reasonable standard, honestly maintained, honestly lived up to, frankly and squarely applied, is worth more in the way of educational righteousness than any standard, however high, which is only on paper.

In conclusion, I may say that I do not believe that any section of the United States, whether that section be north, east, south, or west, can afford to ask the Foundation to accept special standards of entrance for itself. This is true if for no other reason than that the very act of asking for special standards is a confession of weakness. So long as one section remains outside the standard for which the great majority of educated men stand, just so long they cut themselves off from the opportunity to influence in a large way the intellectual standard of the whole country. I may say that since the Carnegie Foundation began its work three years ago great progress has been made toward the unifying of college entrance requirements. At that time there was scarcely a college south of Mason and Dixon's line whose entrance requirements were such as to demand a four-year high-school preparation. Since that date a number of institutions have placed themselves upon such a basis, and at a meeting of the Southern Education Association, which I attended two weeks ago, after a two days' discussion the association resolved unanimously that, beginning with 1910, their colleges should all go upon the basis of the standard four-year high school as a prerequisite for college entrance. This seems to me a result not only of great value educationally, not only of great value socially, but also of great value as a national asset.

In acknowledgment and appreciation of Doctor Pritchett's address, the following resolution was adopted:

Whereas there has been established, through the munificence of Mr. Andrew Carnegie, a Foundation for the Advancement of Teaching, providing retiring allowances for teachers who have performed long and honorable service in American colleges and universities; and

Whereas tax-supported, State-controlled institutions have been admitted to the benefits of this Foundation: Therefore be it

*Resolved*, That the Association of American Agricultural Colleges and Experiment Stations, representing in its membership a large number of such tax-supported, State-controlled colleges and universities, desires formally to express its profound appreciation of the great value to higher education of Mr. Carnegie's act, and its sense of gratitude for the benefits thus conferred upon American teachers. Also to convey to the trustees of the Foundation, and especially to its honored president, Dr. Henry S. Pritchett, its grateful acknowledgment of their sympathetic and helpful consideration of the land-grant colleges.

#### RESOLUTION REGARDING SECRETARY WILSON.

The following resolution, presented by J. H. Worst, of North Dakota, was adopted:

*Resolved*, That we extend to Secretary Wilson the highest praise for his remarkable services as leader in the development of public efforts to improve the conditions of the American farmer and to place research and education in their relation to the farm, the farmer's home, and to our country life generally on a high plane and extend their influence very broadly among the masses of our agricultural people.

Assistant Secretary W. M. Hays expressed the regret of Secretary Wilson at his inability to attend any of the sessions of the convention and the desire of the Department to maintain the most cordial and helpful relations with the State institutions.

At 12.15 p. m. the convention adjourned sine die.

## MINUTES OF THE SECTIONS.

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### SECTION ON COLLEGE WORK AND ADMINISTRATION.

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AFTERNOON SESSION, WEDNESDAY, NOVEMBER 18, 1908.

The meeting was called to order at 3.30 p. m., J. K. Patterson, of Kentucky, presiding in the absence of the chairman.

The following paper was presented by Andrew Sledd, of Florida :

#### RURAL VERSUS URBAN CONDITIONS IN THE DETERMINATION OF EDUCATIONAL POLICY.

The form in which my subject is stated postulates a proposition which seems to me of the utmost significance and importance, viz, that educational policy is to be adjusted to local conditions. This means that there is no standard type of education that is applicable to all men everywhere, and that the determining factor in educational policy is the varying needs and conditions of the sections or classes whom it is proposed to educate. Education is made for man, not man for education.

This is no new idea—it is basal in the organization of the institutions represented in this association; but it has met, and still meets, considerable opposition in the way of its practical and consistent application. Traditionalism is strong in education. It is hard for some to abandon classical authority and precedent; while, on the other hand, I think it should be said that some of us go to the opposite and almost equally reprehensible extreme of denying to the old system and old courses the much good which they certainly possess. I was talking the other day with a quite able professor of agronomy. He assented enthusiastically to the proposition that the old order should be modified to meet our present needs, and especially that the study of the classics should be less emphasized and in many cases entirely eliminated in the process of readjustment. Then he added: "I think everybody ought to study some agriculture." We are in danger of excesses and of superficial interpretation of the essential significance of our movement. The thesis that educational policy should be adapted to varying conditions and needs, in itself a very sound and fruitful thesis, demands for its proper interpretation and application a more thorough study of conditions and a much deeper interpretation of needs than it commonly receives. Many of us have seen a partial truth—some, the good of the old system; some, the good of the new. The men who see the whole truth, or the most of the truth, must correct our partial vision and lead us to the light. Protesting against narrowness, we can not afford to be narrow. Having suffered under error in the days of our weakness, we can not afford to repeat the same error in the days of our strength.

Granting, now, the fundamental postulate of my subject—that educational policy should be adapted to varying conditions and needs—the educational problem becomes primarily a study of conditions, and then of the proper direction of educational forces to meet those conditions.

In the present discussion we have two sets of conditions before us, roughly differentiated as "rural versus urban," and our first step must be an effort to ascertain their essential diversity.

I take it that the man-factor is not to be regarded as a part of the conditions. They are the physical environment of man—things, not man himself. As far as



man himself is concerned, we assume a substantial uniformity of native capacity, and thus secure a fairly constant factor in the discussion. Personally, I can not lend entire assent to the sociological views of Lester Ward, or the scientific contentions of the Weismannites, but a brief paper like this can not treat such questions; and it does not seem that its conclusions would be vitiated by assuming that, in relation to the educational problem now under consideration, the man factor is substantially constant, more especially as there have been distinguished claimants of superiority for the country boy (Professor Giddings says: "Genius is rarely born in the town") and no less distinguished claimants for superiority for his city cousin.

There are, however, some other constant factors which must be recognized, even emphasized, in this discussion. These lie in the conditions and needs which are common to rural and urban life, so far as they are common to both. From the standpoint of social progress, which is the true educational standpoint, I think that we must emphasize the fact that all the general needs of one group are common to the other, so that we can not approach the problem from the standpoint of supplying essentially different general needs. The diversity lies not in these needs *per se*, but in specialized needs and in the method of supplying common needs.

Hence it appears that the differences between educational programmes, rural and urban, are—

- (1) A difference in the method of supplying general needs; the first problem.
- (2) A difference in the content of instruction to meet specialized needs; the second problem.

Further, it must be borne in mind that specialized needs presuppose certain more fundamental needs, and it is a fine and still unsettled question of educational policy to determine at what point these general needs may be considered sufficiently satisfied for specialization profitably to begin. This gives us a subsidiary third problem:

- (3) At what point shall the differentiation between specialized needs, rural versus urban, be recognized? Shall the differentiation ever be complete? Or shall some common elements, representing some general needs, be always present and the differentiation be only partial?

#### I. SPECIALIZED NEEDS.

Now, specialized needs are the most evident and the easiest to treat, and I respectfully suggest that our movement is in danger of failing of its largest usefulness from overemphasis of such needs and failure to realize the essential importance of general needs and the vital relation of specialized needs thereto. It is on the surface that the farmer must make his living by different methods than the city man, and that educational policy for the rural districts must take account of this diversity and adjust itself thereto.

I am firmly convinced that the first duty of education is to raise the standard of living and that school systems should all be grounded on this fundamental principle, and I regard it as a just indictment for radical failure against any policy if it does not issue somehow in increased fitness for survival in the struggle for existence. Consequently, I should have in every institution studies of immediate utility and a money measure, and the principle which should determine what studies would be the environment and the needs of the constituency which the institution is designed to serve.

On this principle of fundamental needs specialized by environment perfect uniformity of school policy would be as impossible as it is undesirable, despite the prevalence and the popularity of the shibboleth. Every school would teach first what its constituency needed, and thus the school, instead of being an alien something laid upon the community from without, would become a vital expression of the community's needs and a natural center of communal life. It seems to me as absurd to standardize educational policy as would be the effort to standardize men or life, and I have little sympathy for any movement which seeks to establish a uniform system for all the schools of any considerable bulks of population, either urban or rural.<sup>a</sup> Schools are not machines to be standardized on a millimeter scale. They are, or ought to be, living agencies for social betterment, and ought to have the freedom and individuality of their life. And the motto on every school door ought to be: "To each according to

<sup>a</sup> This does not refer to grades of work, but to types of schools.

his needs." This means that schools ought to differ in different sections of the Union, frequently in different sections of the same State, and in different wards in the same city. The schools must cease to be the tyrants and become the servants of the people, and this they can do only by recognizing conditions as they are and giving to each community the help which that community's needs demand.

Now, the specialization of needs is roughly indicated by the occupations of the people. In this country one-third of our working population is engaged in agricultural pursuits, one-fourth in manufacturing and mechanical pursuits, one-fifth in domestic and personal service, one-sixth in trade and transportation, and one-twentieth in professional service. Our educational policy ought to give a fairly accurate reflection of these conditions. To do this our schools, taken as a whole, should offer a group of courses somewhat as follows:

- (1) A course in agriculture and horticulture.
- (2) A course in manual arts.
- (3) A commercial course involving some instruction in the principles and practice of trade and transportation.
- (4) A course in domestic arts and household economics.
- (5) A course of literary or cultural instruction, designed primarily for those who contemplate college entrance or a professional career.
- (6) A course in what I will call "equipment for citizenship." This course should embrace the study of the history and institutions of our country, from those of the local community, through those of the State, to those of the nation, together with such treatment of social and economic problems and policies as circumstances might render possible. This work should have a place in all the schools, subject to little local variation. It touches all classes, irrespective of their special calling and needs, and should receive consideration commensurate with its universal importance.

No single school would probably offer all of these courses; but out of them should be selected in each community, first of all, that one which most effectively meets the practical needs of the majority of the citizens of that community. After this first selection, the other courses should be selected in the order in which they serve the interest of the masses of the several localities.

Under this principle a school in a rural community would provide primarily for agricultural instruction. After that, according as the needs of the community might demand and the resources of the school might justify, it would provide for the other elements of its constituency; and we should no longer see schools in agricultural communities devoting attention primarily to Latin and Greek, French and German, a little of the theory of elementary chemistry and physics, and entirely ignoring those elements of instruction which are of immediate and practical service to the patrons of the school, and not only ignoring them, but, by their very constitution and tone, tending to alienate their students from agricultural work and even rural life. But the rural school, conducted on the principles I have indicated, would fit the majority of its pupils for their special work, and would serve the minority as fully as it could after meeting its major obligation.

It need hardly be observed that thus far this discussion has been purely utilitarian. It has advocated the adjustment of educational policy to specialized needs, with a view to producing more efficient workers, thus increasing income and raising the standard of living. But it can not stop here. To raise the economic standard of living is a worthy enterprise and a primary obligation upon educational agencies. But to do so without at the same time giving life a satisfying content would be an educational failure and a social tragedy. Here lies our greatest difficulty and our greatest danger. I can not regard agricultural education (or other purely technical education) as ultimate or as an end in itself. It is only preliminary—a first step in the process of the larger social progress and richer social life. After we have made better workers, and they have made more money and raised their standard of living, then what? There is a limit beyond which the economic standard of living can not be raised to the benefit of society. Further, the rich farmer, without some grasp of life and content therein, would be no more of a social asset than the idle rich among city people, whose number, indeed, he would be likely soon to join. Thus the process of enriching the farmer by specialized instruction, unless we give him at the same time some resources of poise and contentment and some means of satisfying his more emphatic general needs, would probably accelerate the cityward movement which is already taking place under the impulse of economic

motives similar to those which prompt the effort to improve the material condition of the farmer. The trend of civilization is cityward; and merely to enrich the farmer is to send him to the city, unless his education contains some subjective elements of self-content, and educational policy can carry to him those valuable elements of city life which will meet and satisfy his general needs.

Here we are thrown into the depths of our question. To make a good farmer, however difficult in itself, is comparatively a simple matter; but to make a good farmer who shall at the same time be an intelligent, patriotic, and high-thinking citizen, and yet content with the life of the farm, is the final task and the supreme test of rural education. It really involves a reversal, or at least a very considerable modification, of the trend of modern civilization.

The problem now lies in the realm of—

## II. GENERAL NEEDS.

These, as already indicated, do not differ with different classes. They belong to man as man. And the problem is one of satisfying the same needs in different environments, if that be possible. It is a problem of method, and it is presented first and most emphatically to school men who have to deal with the conditions of rural education. We ought not to limit our activities and our studies to the problem of making good practical farmers, as if that were the final goal of our educational policy; but we must deal with the deeper problem of making good practical farmers who shall be at the same time citizens of the highest type and yet remain good farmers. This involves a realization of the fact that the farmer is more than a farmer; that his specialized needs are an incident of his environment; and that his general needs are of the essence of his being as a man.

Now, our general needs may all be grouped under (1) the need for physical well-being, which I will not further discuss; (2) the need for society, including all social relations; (3) the need for amusement, largely social and dependent on 2; and (4) the need for mental activity, including the reception of information and its application, research, discussion, progress, culture, and religion.

These are the needs of normal man, wherever found; and their progressive satisfaction is a natural object of desire and effort. Educational policy has too often ignored the question of a livelihood, and the practical and utilitarian considerations have been too often tabooed in educational councils. Our present attitude is one of protest against this absurdity, and we rightly put the question of livelihood well forward in our policy. I believe, however, that the time has come in this association to raise the point that making of a living is not all in the making of the man, and that the agricultural colleges must stand for larger and more democratic ideals than the mere making of successful farmers. In our efforts to better the farmer's lot some of us are in danger of forgetting that the farmer is a man and that his life can no more be limited or satisfied by the mere improvement of his physical state than any other man's. Unless we are willing to delegate all the work of education in the more liberal sense to another and a separate set of institutions, we must give a just and reasonable place to the farmer's general intellectual and social needs. In such case we would not only become a separate class of institutions, overemphasizing a single duty, becoming narrow, and gradually antagonistic to other institutions of different aims and methods—some of us are that already—but our tone and temper would tend to develop a farmer class or caste, which is no less alien to the spirit of this Republic than any other class. The farmer is a man and a citizen, and we betray our trust if we fail to give a reasonable consideration to his general needs as such.

Now, in urban communities general needs, except the need for physical well-being, are readily met by the very constitution of such communities. There is abundant company of all sorts, with all that implies. All social needs, including such diverse elements as the gratification of religious sentiments and the craving for amusements, are fully met. Libraries, museums, art galleries, together with living enthusiasts for them all, provide at once the material and the stimulus for intellectual activity. No general needs of man must go unsatisfied in urban life.

But in the present organization of rural communities there is little satisfaction for these needs. And while probably no adequate satisfaction is possible for them, still, from the educational standpoint, I suggest that something might be done to improve the situation.

First, by the multiplication of educational centers.



This is a dangerous suggestion and needs some explanation. I do not believe in the multiplication of weak and inefficient schools to satisfy the demands of laziness or effeminacy, to make political capital, to gratify local pride, to boom land companies, or to sustain denominational rivalries. On the contrary, I think that many of these enterprises are reprehensible, and in some cases several should be consolidated, in others should be abolished. Further, where a State or a church is able to sustain one good college in a given territory it seems to me unwise to try to make two colleges, neither good, out of the same resources. But it might be very wise to break up one good college for two or three preparatory schools, and this is the point of my suggestion.

It is a well-known fact that college attendance is drawn almost entirely from the territory within 100 miles' radius of the institution and a large majority from within a radius of 50 miles. Colleges ought, therefore, if they are to reach the largest number of people, to be approximately 100 miles apart.

It is certain, also, that a good college can be run, with careful administration, on \$50,000 a year, possibly on as little as \$25,000. But \$50,000 is certainly a safe estimate.

Now, then, a State has \$500,000 a year to spend on the higher education of its people. Shall it spend the whole amount on a single institution, located probably in some large center of population, or shall it distribute the amount in smaller sums in different localities? If it adopts the former course, it will give better opportunities to fewer people; if it adopts the latter, it will give good opportunities to many. Our oligocentric view of society has issued in the former course, and has tried to give the best opportunities to the few; but certainly a truly democratic programme should expand its opportunities as widely as possible, and if it must choose between the best for a few and the good for the many, it can only choose the latter.

The aggregate Federal resources devoted to the support of our institutions under the various agricultural college acts would sustain a magnificent National university at Washington. Few of us would believe that such an expenditure of these funds would be as profitable to the nation as the present distribution to the several States. By that same token it may be suggested that the expenditure of half a million a year upon a central university, which is out of the reach of the vast majority of the people, is not so profitable for the State as the expenditure of ten times \$50,000 upon ten good colleges located in different and wisely chosen communities. Let every State have as many good colleges (\$50,000 income) as it has sections of 50 miles radius. If necessary, let it provide for these gradually, one in this decade, another in the next, until the field is covered. Then let it develop a great central university for the choicer spirits of all the colleges—a university, not an overgrown college. Meanwhile, let each college reflect the specialized needs of its own community, as outlined above; but let each also minister to the general human needs of its constituents, so as to be not merely an agency for the satisfaction of specialized local needs, but a humanizing influence, ministering to many of the deeper and more subtle needs of man as man.

This brings me to my third and last proposition—

At what point shall the differentiation between specialized needs, rural versus urban, be recognized? Shall such differentiation ever be complete? Or shall some common elements, representing general needs, be always present, and the differentiation be only partial?

A proper answer to these questions may indicate a second method by which rural educational policy may help to meet those general educational needs which are now most readily satisfied under urban conditions, and thus to check the cityward movement and build up a strong, self-contained, and full rural life. If our rural education can be so ordered as to provide a satisfying content to life, to give the farmer resources for reflection, enjoyment, and poise within himself, it will make him less dependent upon crowds and the phenomena of crowds for society and amusements, and will put him in a frame of mind where the lack of libraries, museums, and similar intellectual stimuli, while perhaps more keenly felt, will partly be more easily borne and partly compensated for, or substituted, by his own mental resources, his own books and papers and meditations, and the quiet contemplation of the many advantages of his lot.

In other words, I consider our mission to be to make skillful and efficient farmers, and in the process to make contented men as farmers, and broad-viewed, effective citizens. Now, undoubtedly, skill and success in one's calling of itself makes largely for content, and if given a sufficiently wide interpretation may supply all the fullness of life; so that our effort to make skillful



farmers is not merely a process of satisfying the specialized needs of an important class, but involves an important contribution to the satisfaction of the more general needs of man.

I believe, however, that we rather tend to overemphasize the special feature, and so are in danger of missing the best in our opportunities. As I have already indicated, I can not regard scientific agriculture as a mere process of money-making, as the final goal of this movement. After prosperity, culture; and our courses ought to carry in them the elements of a cultural progress if we are to render the best service to our rural population.

The period of specialization should begin early, and in some cases the curve should rise sharply to its maximum height of specialized efficiency; but in general the rise of the curve should be gradual and attended by a correspondingly gradual drop of the curve of the general interests. If it is of importance to the race to extend the period of childhood, we ought not to forget that the process of mental maturing is both slow and complicated, and that it is not wise to overhurry it. Much time is necessary for the making of a man, and the process of mental equipment and specialized direction should be extended carefully throughout the whole period, so that the time of full specialization would hardly be reached until after the close of an ordinary college course.

To illustrate: Let us suppose that the country boy has sixteen years for his schooling of twenty hours per week per year, or three hundred and twenty week hours in all. His specialized training will begin with his cradle, but it should be desultory, though apt, through the first five years of school life. That time he will spend in learning to read and write and figure—though the contents of his reading, the subjects about which he writes, even the simple words and sentences, will be largely rural, and thus have their value for his future work. Beginning with his sixth school year, this desultory instruction should assume more definite form along the lines of simple nature study and rising gradually into a regular course in the elements of agriculture. About one-fourth of the total time during this period should be definitely devoted to this simple but specialized instruction. This brings our boy to within two years, let us say, of college entrance. Now, if he does not propose to go to college, the curve of specialization should rise sharply until it covers about two-thirds of his working time. If he proposes to go to college, the curve should rise more gradually and cover only one-third of his working time, and this level should be maintained through the first year of his college course. During his second and third college years the curve should rise to one-half of the total working time, and the last year to two-thirds of the total.

On this basis, your student upon graduation would have received eighty-two hours of specialized instruction, distributed over eleven years of his school life, and this would be steadied and broadened by one hundred and thirty-eight hours of general instruction distributed over the same period. In other words, he would have got the equivalent of four full years of specialized training, and all the while his general interests would be kept alive, and the man and citizen would not be smothered in the process.

It must be observed that the disposition of these one hundred and thirty-eight hours assigned to general work is vital in the programme. What I have already said will indicate my general attitude. I should use these hours in such work as has the closest relation to the civic and private life of an American citizen of to-day. Roughly, I should devote seventy-five hours to the language and literature, the history and institutions, social, economic, political, and religious, of our own land; forty hours to the study of science; and the remainder (twenty-three hours) to the study of some foreign tongue and people, that one to be selected which is most nearly related to the specialized purpose of the whole course.

I have a very strong belief that the object of education is the making of good citizens, able to take care of themselves and contribute something to the national strength and life; and I do not believe that our institutions can rightly ignore the more general needs of good citizenship in the effort to make men able to take care of themselves.

If you will bear with me a minute longer, I should like to illustrate this point.

I have before me the catalogue of one of the largest and richest agricultural colleges in the South. It requires thirty hours per week for four years for graduation, a total of one hundred and twenty hours. A little less than one-tenth of this time is devoted to the English language and literature—and that, too, beginning with Lockwood and Emerson and Webster's School Dictionary in the freshman class. Not quite seven hours is given to history and "political

economy," and four hours is given to German. Now, the graduates of this institution may make good farmers, but it is only by the grace of God if they make good citizens. The institution has not done its duty by them.

H. C. WHITE, of Georgia. I presume that with the general principles enunciated by President Sledd all of us will agree. The object of education should be, primarily, the training of a citizen and the making of a man. Education, of course, should have, in addition, some regard to the probable occupation of the man. The utilitarian aspects of education are not to be neglected.

Now, if we could be absolutely sure of the environment of the American citizen, we might very possibly provide in this respect for the special needs of the different individuals. The difficulty, or perhaps the glory, in America is that our communal environments are not fixed. A man who happens to be born upon the farm does not of necessity become a farmer. We have no classes in America which predestine a man to the occupation of his parents, and therefore it occurs to me that the training in those fundamental branches of study which are concerned with the development of the man and the intellectual development of the child are clearly of first importance in American education, whether the education be urban or rural.

It is assumed that there should be added special lines of educational endeavor. In what respects they should differ in the country and the town is, to my mind, very difficult to determine. If we have so developed our courses of instruction in what we call agriculture, agronomy, or horticulture as to give them educational value, and at the same time impart utilitarian knowledge and information, I see no reason why those branches might not form a part of urban education as well as rural education.

The point, to my mind, in this connection, is that we should hold fast to the fundamental training in all cases. I do not think we would be justified in giving up any part of what are recognized as fundamentals in character building for the purpose of introducing special training to meet the special needs of certain communities.

Now, if we were all agreed as to the fundamentals, and in the determination to hold fast to them, we should have less difficulty, I imagine, in considering the proper specialist endeavors to be added thereto.

I think it behooves all of us engaged in education to give proper relative values to fundamental and specialist studies. I should be glad if President Sledd would expand upon that point in particular. The courses of study which he presents, I gather, are largely devoted to utilitarian purposes and not so much to intellectual development.

A word as to the federation of schools. Whether it is better to have ten good colleges or one better university in a State is a question, I think, which may perhaps give rise to a difference of opinion.

Thomas Jefferson anticipated wisely that the establishment of the University of Virginia would inevitably lead to the establishment of a number of good local schools in that State.

I believe the history of other States will show that the best way to get good schools is to establish a first-class college or university in the State, which may serve as a director and guide to the other institutions which may subsequently be established.

If there is only a certain amount of money to expend, I doubt whether it would be wise to expend that in a manner involving a division of the resources. I think it would be better to concentrate upon some really good and efficient institution and look to the influence of that institution to build up local sentiment which would provide for the establishment of others as needed.

As to the classics. I do not suppose the farmer wants to know Greek; I do not know that I particularly care to know Greek myself, but I may say this: I doubt if I can read a page of the Greek Testament or the Greek poets to-day in the original, but I am quite sure I do not know the sum of money in Greek or any other coinage that would purchase from me at this time what I derived from two years' instruction in Greek under Doctor Gildersleeve. We may discard the classics—it may be that we shall certainly discard Greek and possibly Latin—but we should not discard them until we derive from them all the great value which they can give us in the formulation of other courses which we shall substitute for them. Therefore, I may not object to the abandoning of classical training, but only if it shall be supplanted with something which is equally good.

W. O. THOMPSON, of Ohio. I appreciate President Sledd's splendid analysis.

The first point I want to bring to mind is that it is very well, in my judgment, to discuss such questions as these, because it brings to us the practical difficulties in their solution.

The first difficulty that presents itself is the securing of teachers. There are not sufficient teachers in the country to do the things demanded of them and that greatly need to be done. In rural communities we wish the teacher to undertake to teach pupils in accordance with their environments, and to communicate to and inspire them with the spirit that Doctor White rightly speaks of. That demands a magnificent teacher, and the teacher is not there except on rarest occasions. Of course a demand will develop a supply, but it takes time to bring this about. In the discussion of this question we should not fail to consider the best means of providing such a training as will produce a new generation of teachers.

I think we all agree that the modern view is that there is a very close connection between the period of education of a man and the efficiency of this man in the productive years of his life.

The most severe training in the classics is utilitarian; it is of a very high class of utilitarian service. The trouble is that the inferior training in the classics is not utilitarian. It can be justly said that many of those who take a few years of Latin and Greek are simply marking time. They are not being taught the way they ought to be taught. Now, the classics have the advantage in this, that they have been taught for hundreds of years, and agriculture has the disadvantage in that it is a new subject and has not been taught for more than twenty-five years. Over our land to-day there are many teachers who are trying to teach Latin, and who are trying to teach other things, who are chiefly trying.

In the State of Ohio there are about 27,000 teachers in the public schools, and it takes every year from 6,000 to 7,000 new teachers to supply the demand. It is inevitable under the circumstances that a great many of these teachers have not taught four years. Now, what do you think will come out of teaching when people go into it for two or three years at the most? Can you believe that these people often realize upon the ideals of life? It is worth as much as an entire ordinary course to study under a man like Gildersleeve for an hour, after Gildersleeve had devoted most of his life to teaching. So I want to suggest that the teaching problem itself is what we must address ourselves to if we are to better present conditions.

Among the more intelligent people in the country there is a recognition of the cityward drift, and we want to retain in this country population some of the best elements. It will never do to allow conditions to exist that take the choicest boys and girls to the city and leave the refuse in the country; it will never do to have our temporary homes on the farm and our permanent ones



in the city; it will not do for us to live permanently in the city and occasionally in the country. A man would not then be under the kind of environment he would care for. This condition should arouse us to see that our population is equally appreciative of what is best in the country as well as of what is best in the city.

No woman or man is well educated until he comes to appreciate the possibilities of his life. That is what has made the great leaders in our cities, who developed the great street railways, stores, lighting plants, and the great industries. They are men of insight, and seeing the possibilities of their business, they went to work and built up great fortunes. Now, the man who realizes and appreciates the possibilities of country life will make use of them.

The theory has been that happiness is in the next county. That always has been so. You will find when you go to the newer country to settle down you will stay there a year or two and then drop over just a little farther; and you will find in the farthest West that the people who settled earliest came from the East. It takes about three generations of settlers to influence a country. This roving population moves on, but they leave something new. This shifting of population also extends to the big cities. If you live in Chicago and have gotten rich, you can not stay there; you say "I must go to New York;" and if you live in New York you will not stay there; you must go over to Europe, for the summer at any rate, or live in Paris. So that the theory that happiness is in the next county has led us to believe, and we have come to believe it now more than we are willing to confess, that somehow we must be educated out of our surroundings. A good citizen ought to be content to live where he is.

In Ohio we are doing one or two things which I think may apply to this general situation. We have two types of schools in Ohio, a rural school—we call it the "centralized school"—and the township high school. The centralized school simply does away with these miserable little schools of six or eight pupils. The pupils are put in with groups of other pupils of the same age and grade of instruction, where they can be taught intelligently and efficiently. That increases the efficiency of the education. The centralized school has demonstrated its economy, efficiency, and usefulness. These schools teach the elementary grades, and agriculture has also been introduced in a number of them.

I believe most heartily and most thoroughly that we can bring into these local schools all the elements that would make for an appreciation of the schools. I think that the more you bring schools home to the people, the better will be the chance to have the people use what is theirs.

I think that every boy or girl ought to be made to exhaust all the possibilities of the home school before he or she is sent away from home. The longer you keep them at home, the more you bring them in touch with the advantages to be found in the home community. The experience has been that it is our good boys who have gone away from home, and once having left home, it is not easy to return again. Having failed to put into the local community a high-class opportunity, the ambitious boy has gotten out of that community in order to get that opportunity, and once having gotten out he does not care to return.

So that by increasing the local facilities and improving the character of schools I think you will create a great tendency to bring about a keener appreciation of the home. If you do this, then you will have plenty of people at home, and you will have enough there to run the home operations. There would be no reason then why they should want to go away to the city.

The travel from the city to the country is chiefly by people who have sufficient fortune to buy a good home and live there a portion of the year; but that cuts no figure in rural life.



Our problem is to so educate the rural population that in our rural districts there shall be the same grade of intelligence, the same efficiency, and the same citizenship that we find in our cities, and thus break down the tendency toward classification of society as it exists.

We therefore ought to take these local conditions very seriously into consideration. Our cities are doing it, and they have done it both wisely and unwisely. For example, we are apt to run to specialization, as the paper stated. Some of our cities have taken up the commercial high school proposition, but I do not think that education was ever intended to supply chiefly employees for manufacturing industries. Neither should rural schools be designed simply to make farmers.

You and I have no thought now of what the citizenship will be twenty-five or fifty years from now, but we are educating our children now, and they must be so educated that they can adjust themselves to the new conditions; and one of the happy things in modern society is that we have widened the scope of education.

M. H. BUCKHAM, of Vermont. I have not the pleasure of knowing President Sledd, but he had not delivered a dozen sentences before in my heart I said, "That man has had a classical education," and he had not gone far before I said, "He has had a splendid classical education," because while there are many men who have a classical education who get nothing out of it, who simply drone over it; all that clearness and consecutiveness of thinking, that lucid expression which we had in that paper, is one of the finished products of a good classical education. What is there in a good classical education which gives that power of clear thought and lucid expression? It is because it is a combination of the scientific, the logical, and the human. It is all a mistake to speak of the best literature as though it was not scientific, especially the best classical literature. You can not get any more rigid, any more strict science than you get in Plato and Aristotle; but you combine with it the human instinct, the poetical, and it seems to me that what we want in education now—in teaching agriculture, for instance—is to find a way to combine it in a strict, logical, and scientific way with the human, the poetic, the romantic.

My mind reverts to a certain community in my own State, which is a very old-fashioned State, in which there has been for the last one hundred years one of the old-fashioned New England academies, with what used to be called a grammar school, where they teach Latin and Greek.

There are many things about the people of that community I might call attention to. They are most successful and most happy farmers. There is no lack of contentment in that community. You go through the community; you attempt to buy one of those farms, and you will find that they are among the most costly farms in New England. I was on the train one day when a man asked, "Why is it that these farms along here are held at such a high rate? I have been trying to buy some of them, but I can not do it." I said, "The reason why the farms are held at such a high rate is because they are good farms, and the reason why they are good farms is because the farmers here are a highly educated people and a highly moral people." As you go through on the cars you will see to-day a silo on every farm. They have all the new improvements; they are a progressive people.

With reference to the particular kind of education they have had, they have had what, in their time, was the best. That community and every other community that I know of, so educated, have that progressive spirit which prompts them to take hold of the new things and adapt themselves to the new conditions. Now, as to the possibilities of education in agriculture: On the scientific side

we are doing a thoroughly good work. but we have not yet found persons to teach us, so far as I know, who are able to develop it on the other side—on the human side. What a splendid possibility of human development, what a magnificent region of imagination and poetry, and all the joys of the higher life is involved in an agricultural life. It has always been a favorite theme of the poets, and everyone of us, I suppose, has hoped, at some time or other, that he could go back and live on the farm and develop this human side, the side of social and intellectual enjoyment and of religious activity. It seems to me there is nothing at the present day that is so attractive to a man of thought and of genuine religious and spiritual feeling as the possibilities of the agricultural life.

What we want is the kind of teaching which will put these germinal ideas into the heads and hearts of our young persons. They are coming, and if you and I can do anything to hasten the time of their coming, to help to find the men who will give the initial stages to this progress in education, we shall be of the highest possible service to our generation.

H. EDWARDS, of Rhode Island. I felt very much interested in President Sledd's paper because he struck several chords that vibrated very strongly in my own experience and my own feelings. But there are one or two things that grow out of rather than contradict what he has said that I want to mention.

When we undertake to build a scheme such as he has had in mind, we attempt an ideal, a ladder leading from one stage to another, and the reflection has come to me time and time again whether, at the present time, under present stress, with present problems before us, that is the right way to look at it. Are we considering the pupil or are we considering the ideal process that we are going to put the pupil through? I have heard it stated time and time again that in South America the Germans have gone ahead of the English and American traders because they have said to those people, "What do you want?" while the American has gone down there and said, "Here is the thing you ought to have." Is there not something of that sort in the way we are meeting educational conditions, rural and urban, to-day? Is there not in our attitude much of insistence on our own ideals and little of readiness to understand and to meet the needs of the common people? Is it true that these students of ours, beginning at the lower grades, are anxious to accept our nicely arranged programmes and to go through from the kindergarten to the university; is that true? One of the problems that we have to meet, and one of the most serious problems, is that of interesting the student in the work that is going on. We take him in the elementary schools; he wants to drop out at the fifth grade. We take him at the beginning of the high school, and he does drop out, in large measure. At the end of the high school there is only a small handful which is ready, and more or less anxious, to go on to the university or the college. Are we meeting that condition when we talk about these matters of relative distribution?

I think President Sledd is right when he talks about using the interests of the community as in a large degree a foundation for any kind of school work; and for the reason that it is the proper pedagogical process in arousing interest, firstly; and secondly, because it will retain that interest and will profit the man when he has to go out into life. This comes to me time and time again, so that I can not help emphasizing it; do we not think always of the young fellow who, either through sheer pluck or possession of money, is able to take advantage of our fine educational scheme? Do we think of the man who has only six months or three months to devote to schooling? We have had great men, you know, who have done great things on three months of schooling. Do we think of the man who comes to us, it does not matter whether he is wrong in his attitude or

not, but who does come to us and say, "I can afford only a year's schooling. What can you do for me?" It seems to me that this problem is the one that we do not face with our educational schemes. We adopt processes, more or less temporary makeshifts, so to speak, but we do not really reckon on them as part of our actual educational work.

Is it democracy of education that provides for the favored few, favored either in will power or favored in money? Is it democracy of education that provides only for that favored few and does not provide for the large majority, the overwhelming majority, that must depart, that leave the school at almost every junction point that you can mention, even in the middle of the year? I am firmly convinced that technical or industrial or vocational education, whatever you may call it, is the educational work of to-day, because of the fact that sooner or later we are going to abandon the idea of the junction system and come down to the actual needs of the everyday boy and girl, the everyday man and woman, who must have from his school work something that he can put into his everyday life. And so, when we talk about agriculture or when we talk about industries in the public schools, in the common schools, in the high schools, I think that we are eternally transgressing in that we do not reckon on that particular phase of the matter. If every man and woman, if every boy and girl, by some wonderful process, were able to go through our whole educational scheme, then it would all be very well, and it would all work very well, I imagine, as far as ordinary human nature would allow; but that is not the case, and that especially is not the case with regard to land-grant colleges.

We must take into consideration and take into main consideration the man who can not, who does not expect to, at any rate, go from one step to the other throughout the whole series; and so when these gentlemen talk about classical education they are talking about something which for us is beside the mark. Classical education is an excellent thing, there is no question about that whatever—but that is not the question which concerns you and me when we come to look abroad over our land to-day; and President Sledd is perfectly right when he says that those people who have only a certain time to devote to educational work can not afford that long, slow, painful process by which some few here and there, one or two, rise to a degree of efficiency that is above the average. Education to-day, as I look at it, is not a process merely for the man who is able to take it, but it is for every man. In America we were insisting on every man going to school, and rightly. Are we providing the education that it is only fair should be provided when we make that insistent demand? I do not think so. I believe that when we insist on a boy or girl, at great cost, at the cost sometimes of suffering, of self-denial that you and I do not know at all—when we recollect that there are large numbers of children to-day going to the public schools in the cities without breakfast, I want to ask you if Latin and Greek are what we ought to feed them on under those conditions? I have no antagonism to Latin and Greek when they are properly served.

If there is a man of leisure, a man of wealth, who looks forward from the beginning to the end, and says "I am going to give my son twelve, or fifteen, or twenty years of training; I can sustain him until he is 25 or 30 years of age before he must make his living; I am going to do that for my son," he is right, I think, in taking the traditional trend of education. But I want to ask you in all earnestness and in all sincerity whether that training, which is an ideal training, perhaps, for such a man, is what we should offer—all that we have to offer; is what it is right to offer to the man who has known what it is to go without a breakfast in order that he may fulfill the absolute limit of time which the law requires he shall spend in school?



E. DAVENPORT, of Illinois. I have become painfully conscious recently of a conviction that if I were going to work to devise a scheme by which I could waste men's time, I would very closely imitate some of our modern university, high school, and college methods. I think in some cases we could not devise a more efficient time-consuming process than some of the schemes we are perpetrating on the young people to-day. Recently I have had to deal with a great many of that class of special students who come to me and say: "I know just what I want, and can you give it to me?" and my experience is, he is the man who floors the professor. When he comes with a specific demand for something he wants, the professor is very likely to dodge the issue. He says, "I have a lot of things all ready for you, but you must take them in courses."

To fill a human need is our aim, and we have to recast our methods of procedure, I am sure, very largely in this whole educational process before we get through with this job. In other words, we consume too much time. In many respects, to use a homely phrase, the game is not worth the candle. We have to find ways of teaching in larger units, in some fashion or other, of getting more development, and giving more information in a given length of time. But the educational value and the content of value, the information contained in it, put it on either basis you please, is so attenuated sometimes that it requires a microscope, if not a telescope, to discover it. Valuable, of course, but we have to remember the student is going to live a good many years after he is out of college and he will learn something afterwards. Is it not true that we are trying to teach these students everything they ought to know on earth inside of their school years?

#### THE VALUE OF GENERAL CULTURE IN TECHNICAL COURSES IN THE LAND-GRANT COLLEGES.

G. E. FELLOWS, of Maine. It is hardly fair to call upon one for a discussion of a paper which has not been read. I depended partially for my inspiration upon that paper. I think to discuss this topic would be but to continue the one we have already had under discussion, "The value of general culture in technical courses in the land-grant colleges."

To discuss this intelligently and intelligibly we should have to define general culture. That is just the problem that the Association of State Universities has had before it in the last two days, and has not yet reached a satisfactory conclusion. What is general culture, and out of what studies, by what methods, can it be obtained? I am beginning to think more and more that the general culture need not of necessity be obtained from the subjects that are ordinarily called "cultural subjects" only, but may be obtained from any subject and every subject. I have often had occasion to quote the sentence of Doctor Jordan, now of Leland Stanford, formerly of Indiana University, the man who made his greatest reputation, perhaps, as a State university president, that "it matters little what a man studies if he learns it thoroughly," and upon that basis was built the arrangement of courses in Indiana University. They were there permitted to do what most of us now do not favor, specialize from the very beginning. Entering as freshman, a man would say: "I will make my 'specialty' history, or biology, or Greek," or other subject. I am not advocating that now, but it was the basis upon which Doctor Jordan made the statement. He so surrounded the requirements of the "specialty" with other work which must go with it that a man came out with a well-rounded education. His idea was to have one main topic which was so thoroughly studied that the man gained power, and if you will trace the graduates who went forth from the Indiana University during the administration of Doctor Jordan and for some



years after, while his influence was still there—and it is very largely there yet, for the present President is one of his students—you will see that they are holding commanding positions all over the world. It means that they gained power, they gained culture, from a close study of some one thing.

I agree with Doctor Thompson and with every man here who says that we are now preparing to furnish the world with people who are trained to be effective; that is what we must do; they must make an existence, and also be effective. The existence comes from necessity first, and the effectiveness of their lives comes as a result of their good training. But they have not the time to put in all the classical hours that most of us put in in our youth. We did not have the other subjects, but they must get this culture out of the other subjects. In an institution where a four years' course in engineering is now given in almost every case there is a minimum of required modern language, required mathematics, chemistry, physics, and possibly one or two other subjects before the real technical work of the civil or mechanical or electrical or chemical engineer is taken up. I think there is a great tendency to say that these technical students shall have a bit of diluted history and diluted economics and diluted language given to them as a preparation for their technical work, because they do not need as much as the liberal arts student. But they ought to have the same amount of the studies in language, in mathematics, in science, in history and economics that the other men have, for the culture there is in them, and the mathematics that are studied to make an engineer may just as well be studied with the cultural idea if the man is going to be a lawyer and to pursue a course in liberal arts instead of engineering. The right kind of a teacher and the right kind of demonstrator in the class room will make the mathematics studied by the engineer, or the German or the French or the economics studied by the engineer, as much of a culture study as though the man were intending to pursue some other vocation.

The need of culture studies is the topic that I was to discuss after the discussion had been opened. There is need, to my mind, for cultural studies for the technically trained man, because of the necessity for the technically trained man to meet people. Civil engineers and electrical engineers are compelled, if they succeed in their professions, to go before boards of trade, before large corporations which furnish money to finance great enterprises, railroad stockholders, and others and explain their schemes, and show how the investment of money will result in profit to the community or to the corporation. A great many men have been technically trained so that they are thoroughly masters of their professions in their details, but can not properly present their topics to the public or to those who are interested. Therefore there is a definite need for culture for those men that can be obtained and must be obtained in the early years of their college courses. I should place debating, argumentation, in the study of English, alongside of the most thoroughly recognized of the cultured studies in the course as important for these people. I think there ought to be no way by which you could distinguish the technically trained graduate on the day he finishes his course from the so-called "liberally trained" graduate, unless you ask him a special technical question. You ought not to be able to know the difference in his looks, in his bearing, in his ease of speech, in his logical presentation of his ideas.

Therefore, I think that they all ought to be educated together. That is, of course, a topic that does not belong in this discussion, but I favor the joining of the technical institutions and the liberal institutions in one, as far as possible. But in all of the institutions there ought to be such a stress put upon the cultural side of every topic, even though it be in itself a technical one, that the man comes out cultured.

I shall not attempt to take the place of Doctor Thach, but in just throwing out these few ideas I would sum them up by saying, first, every subject must be made a basis of culture, whether it be ordinarily recognized as one of the culture studies in humanities or not; and next, the culture is necessary for the technically trained man because of his association with people. If he would be anything above a workman with his technical training he must have the culture in addition to his technical training.

J. K. PATTERSON, of Kentucky. I have observed that the general consensus of opinion is that among the list of our graduates who are present upon commencement day those who have received somewhat of a classical training, even though they graduate as engineers or as strictly scientific students, are able to express themselves with more ease and in more eloquent language, their diction is superior, and they are able to express themselves with a force and vigor that does not attach to the young men or the young women who have not had the previous advantage of some classical training. The head of our engineering department informs me that he gets better results from those who have taken two or three or four years in Latin and in Greek and in the studies that appertain to the old curriculum than he does from those who have not had the advantage of such training, and I believe that he is correct. It seems to me that classical training gives a wealth of language and a clearness of conception and an incisiveness of statement that is not obtainable by any other preliminary course of training. That has been my experience, and while I would not insist upon a classical basis for the majority of these courses of study offered in our land-grant colleges, it seems to me that if the young man and the young woman can afford the time and the means to take this preliminary training it will inure to their advantage in the end.

Judged by results, I think I may safely say that we should not have had such a nationality to-day if the men who founded the Republic had not been very largely classically trained men. I think that the men who founded the commonwealth of Australia, the men who founded and governed the destinies of the Dominion of Canada, the men who are now shaping the consolidation in South Africa, would not be able to give to mankind the result that has been obtained and will be obtained but for the training of statesmanship that they got upon a classical basis. It has been said of the Germans that their aim in study is to make scholars. You all know the patient, persevering, investigating character of the German student. He spares no time to follow out ideas to their ultimate results and to run everything down to its ultimate analysis, whatever his field of investigation may be, but very often he lacks constructive scholarship, he lacks the power of constructive activity that makes his labor effective. It has been said by the same person that the aim of English education is to make a gentleman, not a gentleman upon the basis of blood, but a gentleman who ought to be representative of the old and the better nobility, and embodies all the characteristics that go to make up our modern conception of a gentleman—gentleness, generosity, manliness. The object of the English training is to do that, and they build upon the basis, mainly, of classical instruction.

Two centuries before public schools were established in England; two centuries before public schools, either primary or secondary, were established upon the continent of Europe, with the exception of some parts of Germany, there existed in Scotland what were called the "parochial" schools, and these parochial schools made the men who enabled their country, out of all proportion to its area and its population, to dominate the civilization of Christendom. It was no uncommon thing for men to go from the parochial schools to the University of Edinburgh or of St. Andrew or Aberdeen, men who had no training whatever except what they got in these parochial schools, and they carried with

them a very liberal amount of training; they carried with them Cicero and Virgil and Horace and sometimes Tacitus. They carried with them not only the Greek Testament but the Anabasis and Homer, and they entered these universities, and became the men who made Scotland what it is and what it has been.

Shall we ruthlessly cut loose from all these traditions and put aside classical culture as of practically no value? My own impression is that wherever there is opportunity and wherever there is a sufficient amount of means at the command of the parents, and where the boy or the girl manifests any disposition to attain to a high grade of scholarship, we should give them the benefits of classical training, at least as a basis upon which to build. It was said by the same authority of which I spoke at the outset, that while the aim of the German is to make scholars in the merely technical sense I have spoken of, while the aim of the Englishman is to make gentlemen, that the aim of the American is, and should be, to make good citizens, and the three ideals are not incompatible. The German has not the constructive ability that the Briton has, although there has been a vast amount of very great scholarship in Germany, and although they have been unsurpassed in what they have obtained in their laboratories with the crucible and the microscope, yet Germany, so far as I know, has never produced a Newton, never produced a Faraday, a Lord Kelvin, or a Darwin. The men who are the leaders of thought, who have been the leaders in molding the destinies of the world, have not been among the Germans, great as is the intellect of the Germans, and much as I honor it, but it is the men who come from your grand old Saxon stock who have the power to analyze into ultimate elements and then the power to build up and construct again.

I think that we ought not to cut loose ruthlessly from the classical system of training our ancestors gave us, from the traditional ideals that we have inherited, but that we ought to stick close by it, and that, so far as may be, we ought still to retain this as the best of all the instruction that we give.

At 4.15 p. m. the section adjourned until Thursday, November 19. at 10 a. m.

### MORNING SESSION, THURSDAY, NOVEMBER 19, 1908.

The section was called to order at 9.30 o'clock a. m. by J. K. Patterson, of Kentucky.

The first paper was presented by P. H. Mell, of South Carolina, as follows:

#### ADMINISTRATIVE METHODS IN AMERICAN COLLEGES.

In the journals and papers during the past year articles have appeared from time to time criticizing the methods of government in operation in some of the colleges in the United States. In the July issue of *Popular Science Monthly* it is stated that in this country the college is a business corporation, while "elsewhere in the world the university is a republic of scholars, administered by them." It is further stated that the "qualifications most regarded in the president (of the American college) are the ability to get money for the institution and a good presence at public functions, but he is expected to 'run' the university." "The professors and instructors are employed at the pleasure of the trustees, and so long as the president maintains his position, this means at his pleasure."

Is that a fair and just criticism of the administrative methods in the majority of the colleges of this country? The purpose of this paper is to discuss what the writer conceives to be the correct form of college government and some of the mistakes made in the past by those in authority in establishing the institutions. There are, of course, weak points in the American system, but what human invention is perfect?

In the American colleges the powers of the president vary greatly. In some institutions he is little more than a chairman of the faculty; in others he has complete control. But a fair examination will show that in the majority of



them the president's duties are well balanced with what may be considered to be the best interests of the college.

In the study of the situation, portrayed by the newspaper controversies this past summer, it will greatly help matters if people will sit down and take careful thought and calmly discuss the outlook, and after assorting all the facts and data, the writer believes that there will be little need for largely changing present conditions of government as constituted in most of our best colleges.

As long as all parties in the college community are on good terms, and the principle of give and take prevails, and courtesy is in common practice, there will be no trouble of importance developed in the college life, even if the president is in supreme control. He, of course, must be a man with a large supply of patience and forbearance, tactful, with a correct knowledge of men.

In writing this paper and reading it before the section the author has the hope that the members, many of whom are presidents, may be induced to express themselves and thus make valuable contributions to the knowledge on the subject under consideration, because of the personal experiences of the debaters. My own experience as a college man, extending over thirty years, may be my apology for appearing before you in a discussion of this subject on college government, and it seems to me that the time has arrived when college presidents should carefully discuss a topic like this and determine if there is any good reason for the criticisms against the methods in vogue.

We may separate our subject into four heads: First, the college community; second, trustees' government; third, faculty government; fourth, presidential government.

#### I. THE COLLEGE COMMUNITY.

Who comprise this community? It consists of such individuals as board of trustees, president and faculty, students, laborers, and other officials not directly engaged in teaching or being taught. The first group of individuals (trustees) must provide the ways and means for the most convenient prosecution of the purpose for which the institution is created, such as buildings and appliances to furnish the teachers and pupils the best means for imparting and receiving instruction. The second and third groups (president, faculty, and students) are a collection of scholars and friends of learning engaged in the common pursuit of disseminating and acquiring knowledge. The last group are officials who have in charge other duties which are important in themselves but are not directly connected with the instruction of youth. In this community there should undoubtedly be some form of government control, otherwise chaos will soon prevail. What form of government is best has been answered in many ways during the past by American college authorities. In modern days, however, we are reducing the government nearer to a business basis, resulting in greater uniformity.

#### II. THE TRUSTEES' GOVERNMENT.

Some boards of trustees often think that the college will suffer if they do not look carefully after the details of its work and keep a close eye on all that the president and faculty do. Information has reached the writer that in one institution the chairman of the trustees requires the president of the college to make a weekly report to him of all matters transpiring in the college, to receive the chairman's sanction before the president can finally dispose of the matter. In this college the dismissal of a student for violation of law will not be allowed before the approval of the chairman of the board is given. It is related of this chairman that during a visit to the college, just before commencement, several students approached him and stated that because of failures on some subjects the president and faculty had refused to recommend them for degrees. The chairman told the boys he would take the matter up with the president of the college and require the faculty to pass the boys for their degrees. The president very naturally protested and stood by his faculty. The chairman called a meeting of the trustees, and the boys received their degrees over the heads of the president and faculty. Such interference with the rights and authority of the president and faculty is subversive of all good order and good government.

In some instances the trustees assume control of much of the machinery of the college by frequent committee meetings and attempt to supervise much of the business of the institution which should be left to the care of the president and faculty. In one institution it was the duty of a committee of the board to



meet at the college shortly before the opening of the session and determine what subjects should be taught by the faculty, how these subjects should be arranged in courses, and the amount of time that should be devoted to each topic during the term. At this meeting of the committee the president of the college attended as secretary. It is needless to say that confusion resulted in such a system. The president and faculty, however, soon asserted their right to control this important duty, and the trustees saw the wisdom in retiring in favor of the teachers.

A chancellor of a well-known university some years ago entered into a controversy with the board of trustees on some subject related to the boarding life of the students. The questions at stake rested solely on matters concerning which the chancellor and the members of the faculty had all the practical experience and knowledge. The board was contending on propositions which were entirely theoretical. After discussing the question for some time, the chancellor resigned. A committee of the trustees was sent to get him to withdraw his resignation, but to urge him to carry out the wishes of the board. One of the committee was a distinguished surgeon of national reputation. In arguing the question he stated that where so many members of the board were arrayed against him the chancellor ought to withdraw his objection and acquiesce. The head of the university answered the surgeon in the following characteristic language: "Doctor, suppose I should enter your infirmary just as you were in the act of performing a most delicate and dangerous surgical operation, and in authoritative language endeavor to stop you by exclaiming, Doctor, you do not understand the operation! Is not my knowledge of this case greater than yours because of my long service as a teacher in charge of government of boys for more than thirty years?" A distinguished general, who was a member of this committee, said to the surgeon: "Doctor, the chancellor is right; this is his business through superior knowledge and experience. His illustration is apt and forcible." The committee reported the reply of the chancellor to the trustees, and these gentlemen withdrew from their position and left the management of the university in the hands of the head of the university and his colleagues.

The trustees have their important position in the government of the college, and their rights and their privileges should be carefully guarded and protected by law. In a well-regulated institution the trustees should manage the financial affairs by judiciously and wisely investing the moneys and, by wise appropriations, give the administrative officers facilities with which to erect the buildings and equip the institution with the best appliances and fill the chairs with intellectually strong and good men. In the erection of buildings the trustees must have the controlling influence. They should meet once per year and fill the vacant chairs in the college from a list of available men submitted and recommended by the president of the college.

The plans for the development of the institution should be submitted to the trustees by the president for their consideration and approval and, after the board have modified, altered, and adopted the same, then the working out of the plans should be largely left in the hands of the president, assisted by his colleagues. The general policy of the college must be determined by the trustees, and there should be wise men on the board to lead the college into the best channels for the highest education of the people. In other words, the board should govern, but should in no particular administer the affairs of the college.

The men comprising the board of trustees ought to be required by law to visit other institutions of learning where high-grade work is being carried on, and should inform themselves on all vital questions bearing on the obligations placed in their charge.

### III. THE FACULTY GOVERNMENT.

The filling of the chairs in a college is a serious responsibility, but if the authorities in charge of this duty do it well poor buildings and inadequate equipment will not prevent the college from taking high stand among the institutions in first-class educational work. On the other hand, poorly prepared teachers and splendid buildings and equipment bring reproach upon the institution.

This question is a matter of more concern to the president and the board of trustees probably than any other duty imposed upon the administrative authorities. Thomas Arnold said in one of his letters on this subject in reply to an applicant for a position at Rugby:

"What I want is a man who is a Christian and a gentleman, an active man, and one who has common sense and understands boys. I do not so much care

about scholarship, as he will have immediately under him the lowest forms in the school, but, yet, on second thought, I do care about it very much, because his pupils may be in the highest forms; and, besides, I think that even the elements are best taught by a man who has thorough knowledge of the matter. However, if one must give way, I prefer activity of mind and an interest in his work to high scholarship, for the one may be acquired far more easily than the other. It is my great object to get here a society of intelligent, gentlemanly, and active men who may permanently keep up the character of the school."

Such teachers are not too common in our faculties, and it is too often the case that brilliantly intellectual men without the other attributes mentioned in Thomas Arnold's letter to a teacher are secured by the authorities to fill the chairs in the college. In discussing the faculty government, this fact must be considered.

Prior to 1870 many colleges had faculty governments. All subjects relating to academic and financial affairs were discussed by the professors, and out of the decisions the president made his report to the trustees. The faculty, having full authority, decided who should enter the college and who should be required to leave for violations of the rules and regulations. The president presided over the meetings and was the officer for transmitting the decisions of the faculty to the students. His office therefore was about the same in character and importance as the chairman of the faculty. This method was inadequate in the rapidly growing and expanding college, and it was soon found to be too cumbersome where quick decisions must be made. In large faculties many of the members are not good business men, and, since the administration of a large corporation requires good business sense, much of the legislation was inadequately attended to. The discussions were often long continued and the final decision postponed from meeting to meeting on technicalities until men, means, and patience became exhausted. At other times decisions were made without sufficient deliberation and thought, resulting in harm. No well-organized business house will long exist if the entire force of the establishment is allowed to have a voice in its administration. There must be a head existing in one man, and he must be given strong powers, or otherwise the business will suffer. A college is a corporation conducting a competitive business, and sometimes the rivalry between it and others of like purpose becomes so strong it is necessary to conduct the entire business with the utmost care and circumspection, so that the best interest of the college may be subserved. The men of the faculty who are spending the largest share of their time in the lecture room and in the laboratory can not place their minds for any length of time on the business problems pressing for solution, nor have they time from their class engagements to carefully consider the great plans for enlarging and extending the usefulness of the institution. In this day, when the college has entered upon the extension work of placing its advantages and facilities in the homes of the parent, and endeavoring to instruct the father and mother as well as the child, it becomes all the more evident that the college is a great business corporation. It requires many men of varied qualifications to perform the work; and the writer is firmly confident that one man must largely control the planning and placing into operation the powers of the institution. The slow methods of our fathers, when faculties governed and the president was selected largely because he was a Christian minister, have passed forever, and a new order of things has arisen, requiring a totally different method of treatment.

#### IV. THE COLLEGE PRESIDENTIAL GOVERNMENT.

There is little time left in the hands of a busy president presiding over a large college to devote to teaching. He must be a well-informed business man, well up with the modern methods for conducting large corporations. He must be resourceful, original, and progressive. The editor of *Popular Science Monthly* has totally failed to understand this official when he asserts that "The qualifications most regarded in the president are the ability to get money for the institution and good presence at public functions." These qualifications are all very well and are to be desired, but if the board stops here in selecting this officer they will fall short of securing the right man for the place of president. The man almost perfect is needed for this post. The ideal man may be estimated as follows:

- (1) A good man in Christian attributes.

(2) A strong man intellectually—who has an acquaintance not too limited with the best literature in letters and science—who can talk with interest in any company on the live subjects of the day and hour.

(3) A broad-minded man, who has traveled enough among his fellows in this country and abroad, if possible, to render himself tolerant and properly liberal in his views concerning men and things.

(4) A patient man, who can control himself under provocation.

(5) A kind hearted and sympathetic being, who will make himself beloved by students and colleagues.

(6) A first-class business head, with sufficient knowledge of business principles to enable him to intelligently direct the officials under him in the discharge of delicate and intricate duties.

(7) A man who can grasp great problems and handle skillfully plans and conceptions involved in the development of the institution over which he presides, who can plan far into the future with ideas which will resolve themselves into a homogeneous and continuous scheme which will make of the college a great institution.

(8) A ruler of men, who will control and govern without making it too evident that he is governing—who can bring to his support all the resources of the institution.

(9) A man without conceit and self-admiration, but being equally poised in mind and heart, with a sufficient self-respect to make him ambitious to do with all his powers of mind, body, and spirit what is best for the college.

Is such a man possible? Men probably closely approaching this type are certainly available. The trustees will be wise if they try to secure a president possessing as many as possible of the above attributes. Such a man will minimize the criticisms against presidential government and will harmonize all contending forces.

We are now prepared for the proposition, viz, the college is a business corporation, engaged in the prosecution of enterprises which must be conducted in accordance with business principles and methods if successful results are to be secured. Therefore it should be well governed and controlled, and an individual head is essential to good and satisfactory management. The American college is rapidly becoming a complicated business concern. The president trained for the work before him must not have his attention and energies directed in struggling with dull students over text-books, the workbench, and in the laboratory. He must appear before the public to present in the most attractive form the advantages of the college to parents and prospective students. He must plan for the future development of the institution. He must look closely after the income and outgo of the funds committed to his charge. He must work for the increase of the finances to meet future growth of the college.

He should watch carefully after the welfare of the instructors and be well informed concerning the best men, and where they can be found for the vacant chairs. He should have a seat on the floor during the sessions of the board of trustees and be allowed a hearing on all questions which affect his administration and the work of the members of the faculty. He should prepare a budget for submission to the trustees only after a thorough and careful consultation with the heads of the departments, and see to it that when the annual budget is passed, all the interests of the college have been well provided for. He should impress the members of the faculty and other officials that he is watching their interests before the board with a jealous care. He must be in complete control of all matters in and about the college, but he must remove himself as far as the poles are apart from all semblance to a despot. The day is passed when a president of a large institution can devote much time to matters of discipline over students, except in a general way. He must know what is going on and must be consulted in matters of serious violations of law. His decision must be given before the student's connection with the institution is severed. But in details of discipline, which have bearing only on training, all such affairs should be left in the hands of other officials. He will be wise if he forms an advisory board of the heads of the main divisions of the college, so that he may place before this board many of his plans and schemes for the developing of the college. In this way he may succeed in securing from his colleagues sympathy and cooperation, and be given much valuable information and wise suggestions.

Finally we reach the conclusion of the whole matter: The college is best served when it is directed by one wise, conservative man, whose mind and heart are united in one great purpose to benefit mankind in the sacrifice of himself.



W. E. STONE, of Indiana. I fancy there will not be much diversity of opinion in this body as to the conclusions drawn by the writer of the paper just presented. One or two conspicuous examples of internal dissension in prominent American institutions during the past year have given rise, I suppose, to the comment in the public press upon the methods of government of American colleges and universities. I doubt if the trend of this comment has found very much sympathy in any of our institutions, either in the governing boards or with presidents or with faculties. We have a tradition, coming down from European educational institutions, that the government should be very democratic, should rest with the faculties; but I can not conceive that such a method of administration would do for a moment at the present time, and in this country, for the reason that our educational institutions are facing conditions of evolution, development, and construction in the educational field to a degree which the European institutions have never known, or at least are not called upon to face at this time. If this is true in general, it is true in particular of the colleges represented in this association, namely, State tax-supported public institutions. In my judgment, the ideal management of a college or a university must be based upon what must be considered good organization in a business corporation. I can not see that there is anything in this antagonistic to educational ideals or standards. What we are after, after all, is results, and the results to be expected from our colleges and universities are educational results. If men are in charge who are indiscreet and unwise and lose sight of educational ideals, they will fail, of course; but their cases will settle themselves, and they will not greatly influence, it seems to me, or modify the right principles underlying the organization of our institutions.

Our colleges are growing and becoming so large that the faculties are groups of specialists. They are no longer composed of men who can undertake or wish to do a great variety of work. We want in our colleges specialists who are devoting themselves to particular lines of teaching. It seems to me that the life of the institution centers in the teacher. He must have freedom, he must have opportunity to devote himself to the work in hand, and I believe it has been a very great detriment to the development of our institutions that we have been piling upon our teachers and professors a lot of duties and responsibilities of which they ought to be relieved. They ought to be free to do two things, to teach and to study and to investigate, and so far as it is possible it is the duty of the board and the president to relieve these men of anything which interferes with those functions. I can not conceive that a college professor who is devoted to his work and ambitious to succeed as a teacher and investigator will desire to have any greater authority or responsibility in the administrative affairs of the institution than it is necessary for him to have. He will wish to be free of these, and I think that the executive head of the institution will do well if he seeks to secure those conditions for his teachers and to encourage and aid them in every possible way in doing just those things and relieving them from others.

We have had some conspicuous examples of governing boards or boards of trustees who conceived it to be their duty to administer all the details of the institution. I think it is only a matter of time when those gentlemen see the error of such a course. After all, the management of the college or the university must center in the president of the institution. If he is a tyrant, a despot, he will soon compass his own fall. If he is a wise man, devoted to the welfare of the institution, he will see to it that every member of the institution is first kept busily at work about his business. I think the opportunity given to members of the faculty, and sometimes the student, to meddle in things which are none of their business has led to more dissension and more



difficulty in our American colleges than anything else. The instance cited here where the students were allowed to approach a member of the board of trustees and secure his ear is an example of that sort of thing. I know of one instance where the board of trustees has passed a resolution directing that no member of the university shall approach the board of trustees except through the president. This might seem almost to be an oppressive measure, and yet if the president is a wise man it can not work harm to any person. The member of the faculty who has a grievance has a proper channel through which to express it, provided the president is a fair and discreet man; and that is the key to the whole situation. I think the governing board should attempt to do nothing more than to govern in the most broad and general way. They should listen to the president's recommendations, expecting him to take the initiative in all matters pertaining to the growth and development of the institution. The governing board should expect from him that he is to bring to their attention for consideration everything vital to the existence and the growth of the institution. He is the expert employed by them to advise them and put them in the way to determine and decide. If they have not confidence in him to that extent, then they should supplant him by some one in whom they do have confidence. But they ought not to encourage the complaints and petty gossip of members of the faculty. The members of the faculty, on the other hand, should have responsibility for all matters pertaining to teaching and the government of students. The entrance, the instruction, the graduation, the disciplining of the student body should rest entirely with the faculty. I think the governing board of trustees has no business ever to say that a student should be or not be graduated; that he should be dismissed or retained. They can not have sufficient knowledge of these details to warrant interference. It is the business of the faculty to pass upon all these things; the courses of study, the complete management and disposition of all business pertaining to the student body.

I can not believe that the faculty should have any considerable relation to the business affairs of the university. If they are busy teaching their classes and working in laboratories and libraries, how can they give much time to the business management of a large institution? I do not think they should be called upon or expected to do so. But I do think that on matters pertaining to the educational policy of the institution the faculty or heads of departments ought to be freely consulted and their opinions have large weight. If the president is a wise man, he will give them opportunity to express their views and will give large heed to their judgment in such matters. The land-grant colleges and the State universities have very great difficulties and very great problems to deal with, as you all know; the securing of funds, the maintaining of faculties, and provision for the constantly increasing number of students are some of these problems. In many of our institutions the direction, in a general way, of the work of the experiment stations and farmers' institutes imposes upon the management a lot of problems which are not primarily educational. These are business problems. They are sometimes almost the problem of the politician or of the man of affairs. How to deal with the general public; how to deal with certain classes and special interests; how to meet the demands and requisitions which are not educational in character; how to secure and retain the confidence of the people of the State—those are all very difficult and complicated problems, and I am sure that the ideal qualities of the president of such an institution which President Mell has set forth here are not too highly stated. It is the duty of the presidents of the colleges in this organization to seek to educate the public and their boards of control broadly and wisely in these matters. I know from conversation with some of the gentlemen here present that

in some of the States the situation is intolerable and ought not to exist. We should feel such an interest in this whole question as to strive and endeavor, wherever opportunity offers, to educate the people with regard to this situation, because until some of the conditions now existing can be corrected they can not do otherwise than hinder the development and the progress of all of our institutions. We have a duty to educate not only the students who are members of our institutions, but we have a duty to educate the public, and I think, sometimes, to educate the boards of control.

M. H. BUCKHAM, of Vermont. A good many features of this situation would be prevented if it were perfectly understood that a member of the board of control, a member of the corporation, a trustee, or whatever you call him, has no power except in the board. If an individual, a student, comes to him, or the president comes to him, he ought always to say: "As an individual I have no power in this matter. This is a question proper to come before the board. As a member of the board, and in the board, I will consider it, but outside of the board I decline to have anything to do with it." I find it occasionally necessary to say to a new man who comes into our board: "You will escape a great deal of annoyance and embarrassment if you will take that position." A new man is very apt to feel his importance and to take pleasure in the service he may render, but he will very soon get into trouble if he allows himself to be influenced by some one who has a grievance and wants to have it dealt with privately by him. Before he knows it he has committed himself on one side of a question when he has not heard the other side. That little suggestion is always received favorably by the member of the board, and he often has occasion to thank me for having made it to him.

W. E. GARRISON, of New Mexico. There are two or three points which I will merely enumerate as I have jotted them down. One is that there is seldom any serious opposition, I think, to the plan of what may be called "presidential government" or "control," if it is perfectly understood that the president's powers are balanced by his responsibilities, that he is to be held rigidly accountable for the results if he is given the authority to do things. Personally, I have had experience in three cases in which the institution was in a sort of transition from faculty to presidential government, and that has been in every case the saving clause in this matter. It was perfectly understood that if considerable authority was given, there went with it responsibility, which was a very sobering thing to a man.

The second thing that occurs to me is this: President Mell said the president should take the initiative. I should hate to be compelled to execute or administer any policy to which I was opposed, but a president does not have to execute or administer every policy of which he is in favor. It very often becomes the duty of a board of trustees to curb the enthusiasm of a president and request him to wait awhile, to lay on the shelf some plan which he has proposed. It never, I think, ought to hurt the feelings of the executive head of an institution to be requested, to be compelled, even, by his board of control, to lay aside some plan which he has proposed; but to have forced upon him a policy to which he is opposed would be a very different proposition. That would be practically equivalent, I should think, to a request for his resignation, if it is understood to be a case of presidential control.

The third point I have is this: Personally, my experience has been so limited and my wisdom is so small that I always feel the need of advice—a cabinet; and there ought to be in every large department in a very large institution some one professor whose specialty it is to view the affairs of that department in their relation to the whole university, to the whole curriculum, to the whole

student body. Every man in the department can not be that sort of man. There are needed the minute specialists who will be investigators, teachers of a small portion of their field; but there is needed also the man who makes a specialty of dealing with the whole field of that department in its relation to the total student body, and fortunate is the president who can have in his institution four or five or half a dozen men of that type and breadth, out of whom he can construct a cabinet.

W. H. S. DEMAREST, of New Jersey. This matter of course differs in different institutions as the nature of the organization differs. In certain colleges, of course, the president of the college is a member of the board of trustees, and even president of the board of trustees, and so far as I have been able to observe or to experience that method of organization it seems to me to be a very wise one, and to really meet situations more easily than another sort of organization would. An advisory council, a committee of administration, as it may be called, does, in my opinion, ease the work of administration. If we are all convinced that the principle which has been put forth is the right one, that the president must have a very large, almost complete, responsibility placed upon him and a very large power committed to his charge, and if on the one hand he has the privilege of being a member of the board of trustees, that eases the matter greatly; and if on the other hand he has this committee of administration or advisory committee in the faculty associated and in sympathy with him it eases administration work very much. It seems to me, however, that the paper, and possibly the discussion also, puts the board of trustees or the governing body a little too far from the practical work of the college day in and day out, year in and year out. I have a feeling of great encouragement and support in the closeness of the governing body through its committees, not simply in the matter of business, as a committee on business to look after the securing of funds or disposing of funds, but a committee on the library, a committee on this, that, or the other of general college interest: and I think that such committees should meet from time to time to discuss these special interests, and that the board of trustees as a whole should surely meet more often than once a year. In our organization it meets regularly four times a year, and I think the value is exceedingly great.

It seems to me, too, that the governing board should surely be open to an appeal by a member of the faculty or by a student. It might not happen in the course of years that such a case would arise. It might be very readily settled by explaining that the authority of the faculty or the judgment of the faculty probably would be the judgment of the president: but the right of ultimate approach and the responsibility of the governing board to take up such matters, it seems to me, can not be questioned.

In the matter of granting of degrees, for example, it surely would go year after year that the board would simply grant degrees, bachelors' degrees, to those men whom the faculty recommended. At the same time, the board is the degree-granting power, and the question in regard to the propriety of granting a degree to a certain man might very properly come before that board. A student who might consider himself unjustly used by the authority of the faculty and the president should surely have the right of appeal. Such a case might not happen in many years, perhaps, but that there should be the right of such approach, and that the governing board should be considered as ultimately in control, seems to me quite wise, while they do in the prevailing way and quite without exception stand by the faculty in their immediate work of discipline and of instruction.



THE EXTENT TO WHICH MILITARY DISCIPLINE SHOULD BE APPLIED IN AGRICULTURAL COLLEGES.

W. J. KERR, of Oregon. Mr. Chairman and gentlemen of the section, I feel rather embarrassed in attempting to discuss a paper which has not been presented before the section. I had not had the opportunity of seeing the paper, and since my name appeared second for the discussion I was depending for what I might have to say upon the views expressed by the preceding speakers.

Some difficulties have been encountered during recent years by the land-grant colleges in arranging for work in military science and tactics so as to meet the requirements of the War Department and at the same time not interfere seriously with the other work of the institutions. These difficulties, however, have no doubt been largely due to the rapid increase in the student attendance and the lack of adequate facilities for the work, rather than to any general disposition to ignore the regulations of the War Department or to underestimate the importance of the military instruction.

The extent to which military discipline should be enforced in the land-grant institutions is a question regarding which there are no doubt differences of opinion among members of the section. In some institutions, such as the Agricultural and Mechanical College of Texas, military discipline is applied throughout the entire day, much on the same plan as at West Point. In most of the institutions, however, this is not true. Indeed, the conditions are such that it would be impracticable, even if it were desirable, to carry out such a plan. I know it would not be possible to do so in the Oregon Agricultural College. We have a regiment of 800 cadets organized into four battalions of four companies each. There are dormitory accommodations for only about 100 men, so it would be impossible to carry out such a plan as the one followed in Texas. This is no doubt true also of most of the other land-grant institutions. Furthermore, the conditions are such under which the students pursue their work in these institutions, and the vocations which most of them will follow after leaving college, that to keep them under strict military discipline, on the plan followed at the Texas college, during the entire period of their college training, or even through two years, would be of very doubtful advantage. On the contrary, it would no doubt be far better to place upon the students greater personal responsibility, to give them more freedom and a greater opportunity for initiative and self-government.

It is my opinion that military discipline should be enforced in the land-grant colleges only when the students are engaged in the work of the military department. In order No. 155, of the War Department, appears the statement that "it shall be the duty of the professor of military science and tactics to enforce military discipline at all times when the students are engaged in military instruction." If military discipline should be enforced only when students are engaged in the work of the military department, the question then of determining the extent to which there should be military discipline would hinge upon the amount of time given to the military work.

The War Department has named as a minimum requirement in military science and tactics three hours a week through two years, two-thirds of the time being given to practical work and military drill, including guard duty and other military ceremonies, and one-third to instruction. In a letter received recently from The Adjutant-General it is explained that the main object of the military instruction is to qualify students to be company officers. Now, it must be agreed by those who have given the matter careful consideration that it is practically impossible, in two years' time—particularly during the first two years of the college course—to give men the necessary training for efficient



service as company officers. The efficiency of an organization is measured by the character of the officers of that organization. If, therefore, the military work in these institutions is to be successful, and the cadets are to receive the training required to meet "the main object of the military instruction," more than the minimum time prescribed by the War Department must be given to this work.

I realize, however, how difficult it is in some of the large institutions to give more than the minimum time to the military department. In fact, I think it is quite generally understood that this limit was agreed upon as a compromise, and not because it was considered that the time is really sufficient for satisfactory work.

In the Oregon Agricultural College all men who are not physically incapacitated are required to take military drill through the entire course. Students who take the secondary industrial courses get as much as six years' work, of four or five hours a week, in the military department. The commissioned officers are chosen almost entirely from the senior class, and the work is eminently successful. It is also very satisfactory, not only to the faculty, but to the students as well. Indeed, there is no other work in the college that is more popular with the students. This is shown by the fact that with about 800 cadets not a half score applied this year to be relieved from military drill. It is my opinion that the unpopularity of military instruction in most of the colleges is due to the inefficiency of the work. The officers have had neither the training nor the experience required to do first-class work, and students take it merely as a matter of compulsion. This is unavoidable where the minimum time is given to the work and the officers are chosen from one of the lower classes. To overcome this difficulty some of the colleges which require only the two years' military instruction offer special inducements to juniors and seniors to serve as officers.

In conclusion, it is my judgment, based upon experience in institutions that require only two years' military work and in the Oregon Agricultural College, in which this work extends through from four to six years, (1) that, while in some of the largest institutions it may not be practicable to make more than the minimum requirement, far more satisfactory results are obtained where three or four years' military instruction is required; and (2) that it is undesirable and, in most institutions at least, impracticable to enforce military discipline at other times than when the students are engaged in the work of the military department.

W. E. STONE, of Indiana. After quite a good many years of experience in one and another capacity with the instruction in military drill in our colleges, I begin to come to this conclusion. I think it is of the very greatest importance that the students in our colleges or land-grant colleges do have instruction in and knowledge of the principles of military science. There is an excellent reason for that, and the graduates of our colleges are particularly qualified to be of service to the country in times of war. I am not so well convinced, however, that the purpose of their instruction or the character of the services which they might render eventually is best met or prepared for by training in the manual of arms or the school of the soldier. I find this is true of the young men who come to our college, that they look upon military drill as a thing which belongs in the secondary school. Young men 18 years of age and upward, and many of them older than that at the time of entrance, look upon the uniform and the drill and the brass buttons as things which belong to boyhood rather than young manhood. Now, they may be wrong in that, but I have a great deal of sympathy with their feeling that when they are spending their time and money to go to college for a specific purpose, they are not looking forward to the military service.

They are not unpatriotic, but their business in life is something else, and they do not care to spend the time in military drill, and there is a sentiment against it among the young men in our part of the country which is real and genuine and for which there is some basis. I think it is a proper thing to think about in our institutions as to whether the relations to the Government and the needs of the Government are best served by requiring our young men to spend so much time as they do in a mere manual exercise, and if perhaps the interests of all might not be better served in some other way.

I think there should be instruction in these matters: In military history, in the theory of military strategy, perhaps in the application of military science to military operations, and military engineering and military subsistence. I am not a military man, and I can not elaborate this thought extemporaneously, but there are certainly many lines of service to the military organization in times of war which are not represented by the man carrying the musket. If it is true that soldiers can not be trained and prepared in the field after war breaks out, it is also true that the technical men, who are the nerves of military organization, must also be developed in advance. I think that our students can prepare to serve their country in a more efficient way than by spending so much time in military drill, which perhaps they will scarcely be called upon to exercise in the field in any emergency. So that so far as I have any answer it is in the way of a suggestion that the military instruction in our institutions be devoted to a less degree to the manual of arms and more to a study of the technical or engineering phases of military operations. I think the tendency in many of the courses in our land-grant colleges is going to be to relegate many things to the secondary schools and devote ourselves to things that belong more to men of college grade and college years, and I think that the military drill is just one of those things. It belongs to the secondary schools, or is best done and most appreciated by young men of secondary school age.

J. M. HAMILTON, of Montana. Out in the far west we are surrounded by army life—posts near the Indian reservations and things of that kind. Our young men see a great deal of army life and they do not have much liking for it. They are not taking military drill with the idea of ever being soldiers, and I would like to ask what is the main purpose of this military drill? Is it to prepare these young men, in case of an emergency or need, to be soldiers, or is it for the purpose of physical development? What weight, what value should be attached to military drill as a means of physical education? Should it be considered the main means of a physical education, especially in the smaller institutions, like we have in Montana? I find that out there we can appeal to our students from that standpoint. If they can see that it is a useful physical drill, that it has enabled them to handle themselves better, and make a better appearance, and that it is of physical advantage to them, we can appeal to them; but in Montana, with its history of Indian wars and things of that kind, I can not make much of an appeal to young men from the standpoint of a soldier. From what they see of army life they do not want any of it; they are not preparing for it, and they do not respond to that kind of an appeal. I would like to hear from someone as to the value of military drill from the physical education standpoint.

E. R. NICHOLS, of Kansas. This happens to be a condition and not a theory, perhaps, that confronts us. Personally, however, I should dislike very much to see the actual drills given up. We were told yesterday, I believe, that the average collegian looks upon the physical drill as a physical exercise rather than a preparation for war. Answering President Hamilton's question, undoubtedly the purpose of putting this in as a requirement in the land-grant colleges is to

prepare young men for actual duty in case of need. You will remember that the first land-grant bill, which was vetoed by President Buchanan, made no preparation for military training. The present bill, passed in 1862, when we were in the midst of war, provided for the preparation of young men for military duty; so that undoubtedly is the idea that the Government had in making this requirement. Both from the physical standpoint and the standpoint of preparation for war, I think there is nothing better; and while it may be somewhat childish, and below the age of our students, yet, in the main, I think that the students themselves by a very large majority would vote to continue the exercise where it is carried on with the proper spirit and required fully. If you excuse them, and if you excuse for very flimsy reasons, they will probably all want to get out of it; but if you hold quite rigidly to the requirement they will expect it, and I believe they go into it with spirit and get much good out of it.

From a physical standpoint it is most excellent. We get the green country boys, who have all sorts of habits, and it straightens them up, benefits them physically. So far as Kansas is concerned, we have quite a number who have gone into military life as a result of the training there, and I should dislike very much to see it given up.

H. EDWARDS. It seems to me, in view of what we heard yesterday, that there should be a larger appeal to us in the matter of service of country than seems to prevail, judging from some of the remarks we have heard this morning. I do not feel that the United States makes any great call on its men for military service compared with that made upon men of other countries. If we lived in Germany or France we would find that it was men's business, not boys' business, to bear the musket and wear the uniform. I do not consider it childish at all. If we go out in the life of our States we find that every now and then we are called upon to depend upon our militia for serious civil or military duty, service to the State. Why, then, should we, who get from the Government a large apportionment, neglect or in any way cease to impress upon our students the obligation that they owe to that Government? The uniform if childish is so because we look upon it as childish. There has been a great deal of talk, I know, about brass buttons, and I know that many of our college men do feel that they are above that sort of thing; and yet there is not one of them that goes to these institutions who does not receive from the Government individually a far larger pay for the time he spends in that way than he could receive in any other way.

So far as the actual drill is concerned, I would not give that up at all, not for a moment. If there is anything in what we talk about in other lines of work, surely we ought not to divorce theory from practice in this matter. We are not preparing people to go into the army except under unusual circumstances, but when those circumstances come the man who is called out from civil life needs just that training. If he is in the lower schools, if he has been drilled, as sometimes happens with us, two, three, or four years in the high school with a musket or as a subordinate officer, some cognizance should be taken of that fact; but the great mass of our college men do not do that at all. If you sent them out with only theoretical knowledge, whatever it might be, they would not have the actual ability to handle men in the field, and that is the first purpose of this instruction. Two purposes are subserved by military instruction. One is, as I have already stated, the physical education of the young men. I think that is very important. However much we may develop our athletics—and I believe thoroughly in athletics—there will always be a large class that do not take part in them. The drill reaches that part. Secondly, I think we need strongly to emphasize the fact that more and more as



this nation progresses it is going to have to call on its citizens for some degree of military service.

J. H. CONNELL, of Oklahoma. The question has come to me many times of recent years in connection with the military branch of the college life, What can be done to enliven, to lighten, the drudgery of military drill in institutions as it is practiced and taken by the average student? Four years of the manual of arms and company formation and field movements to the earnest student is drudgery, and the average student in the average college where the four-year drill is in vogue gets just that, unless, perchance, he is made an officer and shown something of the other side of military life. What can be done to enliven that work? I am a graduate of a four-year course in military drill, and was a serious student, and had no intention of learning anything more in the drill than I was forced to learn, and it has been a standing question with me for twenty years how to lighten the burden of the manual of arms and the field movements for the average student in college.

A. B. STORMS, of Iowa. These institutions with which we are connected are becoming more and more severely taxing and technical in their work. Every course has a laboratory attachment, and the days are full. It almost appalls one to look over the average schedule of the average student, and we ask the question how we can reasonably expect them to put enough time on their studies in their rooms to prepare their work for the next day, the work that needs to be studied. This technical work takes students away from natural interest in military drill on the campus. What President Stone and some of the others have said is practically a frank confession of the fact of the situation as it exists. I suppose we in Iowa may not be meeting the minimum requirements of the war office as indicated, but we are meeting the situation, and I believe meeting it more successfully than if we put on a severer requirement. Students are absolutely required to take two hours of military drill in their freshman year. In the sophomore year it is not a requirement. They may take it or they may substitute a sufficient amount of physical culture in some other department. But in the freshman year it is required. It is looked upon as a preparatory work, a preparatory grade of discipline, and we can not help that if we wanted to. Military students are designated as "prep" students, and it is looked upon as a sort of set requirement of those in the freshman year. We have one of the most successful disciplinarians, who is a member of the faculty, and everything possible is given that will give dignity to that drill; but in the nature of the case a four-year requirement of a military drill is becoming an impossibility. The requirement has been two years, and now it has been modified to the freshman year alone; and, as I say, I do not believe that meets the minimum requirement, but it has solved a great many perplexities that did exist in actual experience.

W. E. STONE. At Purdue University we have always been greatly puzzled as to what to do with applications for excuse from military service. Our commandant said: "This year there shall be an alternative. A man who wishes to be excused from military drill shall be excused, but he will have to do an equivalent amount of work in some other department." So we prepared some courses of study for those people, and were really desirous that there might be a large number of applications for relief from military drill, because of the unwieldy size of the corps. The commandant even went so far as to say that he would not admit certain people to the military corps—those who had not been in previous years satisfactory in attainments in the work and those who for any reason would not be eligible for enlistment in the Regular Army. He rejected all those people, and then prepared to receive the applications for



relief from others, and they did not appear. Out of some 900 students under consideration there were less than 100 who were either rejected or excused on application, and some of those who were rejected came around and asked to be readmitted to the corps. I just mention that as a suggestion that might be of value. If you make the excuse carry with it an equivalent amount of work somewhere else, they will not be so anxious to be excused. However, I do not think they like drilling.

J. L. SNYDER, of Michigan. At the Michigan Agricultural College we require drill during three years. We excuse students during the junior year for the winter term, or a third of a year. It is optional with the seniors, and our commandant told me this year that so many seniors applied to take the work that he had to reject many of them. He could not make them officers, and he did not care to keep a senior drilling in the ranks. Those who had not been able to receive quite marked promotion in the past he had to reject. He turned down a number of applicants from the senior class who were anxious to take the drill. I may say that we nominally allow credit for drill, but the facts are that the credits amount to practically nothing, because they can not substitute technical work, and they are not permitted to substitute it for other work.

J. K. PATTERSON, of Kentucky. I have a letter from Governor Willson, of Kentucky, who is very much interested in military education. He is the chairman of our board of trustees, and in that capacity I invited him to come to Washington and be present at the deliberations of this body, but he explains to me in a letter that pressure of business at home prevented his coming. He sent this letter, however, to me with the implied request that it be presented to this body, and with your permission I will take occasion to do so:

MY DEAR PROFESSOR PATTERSON:

I regret very earnestly that I can not be present at the meeting of the Land-Grant College Association to show my interest in their work and to learn more of it to help me be more useful in helping them, but my duties here will not let me go.

In view of the relaxation of military discipline in the State university of the juniors and seniors, I wished to urge upon the conference not only the duty but the very great value of military discipline to our youth. It is a duty, because the act of Congress of 1862, which made the allotment of public lands for these colleges in section 4, expressly included "military tactics," clearly, to supplement the existing laws made to educate our people for military service, and especially to have officers ready in case of any need. It was a wise law. We can not have too many of our young men instructed to be ready to serve their country in case of need.

But it is even more valuable to our young men themselves. I can not tell what I would give now if when I was in school and college I had had the great good of rigid military training, the setting-up exercises, the lesson of power of organization, training, discipline, obedience, and command; the lesson of duty to our country and our laws, the stimulus of rivalry in learning that lesson; and, above all, the splendid upright, clear-eyed front-faced bearing and spirit of the trained soldier-gentleman. The lesson of implicit obedience must precede the lesson of knowing how to lead or command. One must obey before he uses authority, and no student in college is never old enough not to be blessed by this lesson. It is worth more than any one branch of study or education. One must have a sound body and erect, gentlemanly bearing and carriage to half utilize the best mental gifts, and I hope that the law will be made more strict, and that all the colleges will anticipate the need of such a law and make their rules strict and without exception to any who is not physically crippled or disabled so as to make it impossible. If we had hundreds of military schools, we should have thousands ready to act as officers or highly intelligent soldiers in any case of need; but that need is rather exceptional, and the main good of this training is to send out thousands of splendid young men soldiers and gentlemen of splendid, erect, and well-trained bearing, of young men taught that it is just as indispensable to obey as to command, with greater understanding of the duties and

responsibilities of life and of the great good of organization, training, and discipline.

If I were to decide for a son of my own or for myself, if I were again young and had the knowledge I have now, I should dispense with any branch of study before the military part, and I urge upon every one the practice of insisting upon full, generous, and ample time being given to this military work of these colleges, and I am sure that the result will be an unmixed blessing to every youth who has the training, a great uplifting and splendid example to thousands who can not get it, and a never-ending good and safeguard to our country and our States.

Our State guards need these trained young soldiers with all the good of a liberal education and the thorough training of a soldier, for officers who will, by their force of character, their influence, and their fine gentlemanly qualities, be competent to organize good companies, to train them thoroughly, and to inspire them with that fine spirit of the soldier which will make them of the greatest benefit to the State.

Few of our companies now can secure the right kind of officers to organize and keep up and train our guards. We have as good men for soldiers as any State or country, but we have very few competent officers. I seriously oppose any exemption of any class or classes from the strict rule of thorough military training in every year of the college course, and I do this solely for the good of the young men and all who care for them and for the good of the State. I hope General Bell and all who have given this matter useful thought will help organize the thought and opinion of your conference on this subject, which will lead to the adoption of very strong resolutions upon the subject and organized action to have Congress pass laws which will permit of no exemption except for the young women and the men who are physically incompetent.

Yours, truly,

AUGUSTUS E. WILLSON,  
*Governor of Kentucky.*

I have given this matter a great deal of thought, and while I fully agree with what General Bell said yesterday in regard to the strength, both of the defensive attitude of this country and the offensive, if it should assume that rôle, I have a strong conviction that we will lose a rare opportunity if we fail to comply with the spirit of this law of Congress. There is no country in the world that possesses the elements out of which a soldier is made in a higher degree than the United States of America; and while we occupy a comparatively isolated position and, so long as we have a strong fleet, are not likely to be assailed from abroad, still the possibility may come. Our tendencies are pacific, but we should be prepared to meet emergencies. To maintain an adequate force that would furnish the nucleus for a good organization as a standing army would require not less than three or four hundred thousand men in this country. That would be a very expensive operation. It would involve for military expenditure at least four times as much as we are expending now. If we had a trained militia in every State in the Union, properly disciplined and properly organized, called out for military exercises two or three times a year, and their exercises continued sufficiently long to give them knowledge of field practice and of the operations of war, you would be able to meet any emergency in a comparatively short time, and with comparatively little expense. There are militia in training in the United States now amounting to not less than three or four hundred thousand men, all told. We have about 8,000 or 10,000 of them in Kentucky. In States like New York and Pennsylvania and the larger States they are correspondingly more numerous. But these militia are comparatively worthless unless they be properly trained and unless they have the nucleus of an organization to begin with, and officers able to manipulate them and organize them and bring them into proper military shape and training, so that they may be made effective at once and incorporated with the standing army of the United States. From an economic point of view that would be an immense saving.

The sine qua non for a good military organization is to have good officers, and where can you look for good officers better than in the land-grant colleges of the United States of America, organized partly for that purpose in accordance with the spirit of the organic law, and to which are detailed by the military department—the War Department of the United States—the necessary officers to carry on all this system of military training, whether it be long or short? From an economic point of view we could, in case of emergency, spend several hundreds of millions of dollars. We can afford to keep a small standing army if we have an efficient trained citizen soldiery ready to take the field and to be incorporated with the standing army of the United States in an emergency. We are never likely to be subjected to a conscription here. It is alien to the thoughts and the feelings and traditions of the Anglo-Saxon stock, but, while that is a fact, and while we are not disposed to submit to conscription, and never will, yet we ought not to neglect the fact that we have the very best element for forming an army and forming it at short notice, if only the necessary precautionary measures be taken to provide the necessary instruction at the proper time.

While we are a peaceful race, we are not an unwarlike people. That is to say, we are ready to defend ourselves, or think we are ready to defend ourselves, whenever we are called upon. But we had a painful experience in regard to that in the civil war. It took weeks, months, and years to bring the citizen soldiery, of the United States on the one hand and the Confederate States on the other hand, into the necessary degree of efficiency to make them effective, and while that was being done they died by the thousands; they perished like flies. They knew nothing about sanitary measures; they knew nothing about how to manage the commissariat of the army. They were utterly ignorant in all these matters. The United States had been at peace so long—fifteen or twenty years since the period of the Mexican war—that the United States Army, even the standing army officered by West Point men, knew practically little of the usages and experiences of war time. Now, we can obviate all that by giving the necessary amount of instruction in our land-grant colleges, complying with the law, doing our duty in the matter, and utilizing to the extent of our requirements the means that are placed by the United States Government at our disposal for effecting this end.

JOHN HAMILTON, United States Department of Agriculture. I am greatly interested in this discussion, having had some experience in military matters as a soldier during the civil war. I was in it for three and a half years and had opportunity for knowing something of the requirements of a man in the field. I also had charge of military instruction and drill in a college for a number of years and was obliged to study this question in its application to young men who are undergoing instruction in college classes. I can appreciate the difficulties that you gentlemen have found in interesting your students in the forms of military exercise that most of the colleges are pursuing. The method is quite similar to a custom that once prevailed in a college with which I was connected, where exercises in farm practice were required. The students went daily upon the farm and were required to pick stones, clean out stables, and do many other ordinary things that had in them no intellectual value whatever. The young men naturally soon became dissatisfied with farm practice. There was nothing in it to instruct or to stimulate them intellectually. Consequently there was continual objection to it and disposition to evade it. It was the monotony of the tasks, due to their lack of educative power, that caused the labor system to come into disrepute. It was felt that it was unfair to a student who was in college for intellectual training to require him to engage



regularly in exercises that were so simple and elementary as to constitute a waste of time. He needed his time for something more valuable.

That is the criticism that is made, I think, upon military drill. A young man who is in college is capable of understanding the manual of arms and the ordinary evolutions of a company in a very short time. He can learn the times and the motions in the management of a musket or in handling a saber; he can be taught to wheel by fours or by platoons, and, indeed, most of the evolutions that are performed upon the field, in a few weeks if he has good instructors. We do not, in our teaching of this subject, observe the principles that control in teaching other subjects. When a student, for instance, has become familiar with a method of practice in his laboratory work, he is excused from the further practice of that method and takes up something in advance. In our military training, on the other hand, we insist that after he has become perfectly familiar with a practice he shall continue for two or three or four years to perform the same evolutions long after they have ceased to have in them the slightest intellectual interest. Now, the remedy is to put into this military instruction some features that will be of service to the young man later, even in civil life; that will not only stretch him intellectually during the time he is under instruction, but something also that will make him feel that it is worth while to devote time to its acquisition and that will be of special use to him afterwards if he is called upon to be in command of troops.

I was asked once to respond to a toast at a military banquet. When my time came, I said that I had some thought of writing a military tactics, and if I did I had planned to divide it into three parts. The first part would include fully three-quarters of the volume. The next part would occupy the remainder, with the exception of a few pages. The first part, upon which I would dwell most extensively and carefully, would not be a tactics at all; it would be a cookbook. The first thing that a man must know in military life is how to take care of himself. That is essential. We lost more men during the civil war because they did not know how to take care of themselves, or would not take care of themselves, than from all the bullets that were shot. About all of the men that were lost in the Spanish-American war were from typhoid fever and exposure; and they were lost because neither they, their officers, nor their surgeons knew how to live under such conditions. A man should be taught that in war the first and most important thing is to know how to cook a ration. If I was going to teach military tactics to-day, I would take an army ration as it is issued in the field and teach the men how to prepare it. I would teach them also how to live in the midst of malaria or of typhoid fever and protect themselves against them. This is a comparatively simple matter if we make use of the information that we now have at hand. These men whom we are training in military affairs in college are to be officers. Each of them, perhaps, will have at least 100 men under his control. He will be responsible for their lives. He can save their lives if he will; and he can lose them all, and never a bullet strike a man. Their health is of the first consequence.

If you will pardon me, I will illustrate what I mean by relating some personal experiences bearing upon this point. I was in the cavalry service and was trained under an officer of the Regular Army, an officer who understood his business. I had been in a cavalry company before the war. In our drills as militia pretty much all of the evolutions were performed at a gallop. When we got into the army and came under discipline, if a man galloped his horse down the street some officer cried out: "At a walk, sir." Our drills were for the most part at a walk. We were not allowed even to strike a horse and were required to curry them twice a day, twenty minutes each time. Every horse had to be clean. I did not understand why it was that we were not permitted to gallop



our horses and that we had to curry and feed and care for them so scrupulously until we got into actual service. Then it was all very clear. The horse was to be prepared for the day of battle. He must be in the best possible condition on that day, and if he had been broken down by unusual exercise or neglect in the previous period he would be worth nothing when the crisis of a battle comes, when he may need every ounce of strength that the most efficient horse possesses.

A man in the army is also for the day of battle. Whatever is necessary to put him in fine physical trim must be done in order that he may be efficient when that day comes. The instruction in our colleges should teach men how to take care of themselves in order that they may know how to take care of other men; should teach the proper preparation of food; protection against the weather—how to live out in any climate without being injured.

The second great requisite in war is knowing how to shoot. First, you want an efficient man physically. Then you want a man that can shoot, and shoot straight. If I were at college now and had my way in teaching young men, I would spend a large time in target practice. If it was an artillery drill, I would have shells, modern shells and modern guns, everything of the most improved pattern. I would instruct them in the use of these guns by actual practice in the field. I would teach them how to estimate and to calculate distances and do all of the things that field work with artillery requires. If the men were infantry, I would teach them how to protect themselves from the enemy's fire by taking advantage of natural defenses, how to throw up intrenchments, how to construct fortifications, etc. They should be taken out into the country to study its topography from a military point of view. In fact, as nearly as possible they should have in college work analogous to what we are requiring in practical work in other directions—experience with conditions as they will find them in war. The least possible attention should be given to the mere matter of presenting arms, shouldering arms, ordering arms, wheeling by fours, column right, and column left. These are necessary, of course, because discipline is necessary and men must be taught to obey and to understand the organization and its evolutions, but when you come to the actual matter of war—the marching into action in dress-parade ranks, with flags flying, bands playing, horses prancing—you will find these things to be largely myths, particularly when your enemy is concealed a couple of miles away and is busily engaged in shooting at you. Teach the men how to use the range finder, how to protect themselves from bullets, to care for themselves so as to be efficient when the day of battle comes, and how to shoot so as to hit the enemy, and you will not only have given them the essential and important requirements of war, but you will have interested your men while the instruction is being given.

There is a great deal outside of the mere manual of arms and outside of the brass-button feature of military life that is educational and that is absolutely necessary to be known before you go to war. If you have not learned it before you enter active service you must learn it afterwards or you must die. It is in these directions that those who are interested in the development of the military training of young men in the land-grant colleges should devote their energy.

H. EDWARDS. For the sake of the record and those who read it, I just want to inject one remark here, and that is that if the whole time during the four years that are spoken of were condensed into one solid mass of ten hours a day, the amount of time employed in such work as has been mentioned would not come to thirty days in the year. It would not amount to one month. I would like to say also that I highly approve of the remarks that have just been made,

and that arrangements are carried on in our military work to provide just such training, even to the matter of cooking.

ELECTION OF OFFICERS OF THE SECTION AND MEMBERS OF THE EXECUTIVE  
COMMITTEE.

The committee on nominations, consisting of M. H. Buckham, of Vermont; W. E. Stone, of Indiana; and E. Davenport, of Illinois, nominated for chairman of the section P. H. Rolfs, of South Carolina; for secretary, W. J. Kerr, of Oregon; for three members of the executive committee, W. E. Stone, of Indiana; J. L. Snyder, of Michigan; and W. O. Thompson, of Ohio.

The report of the nominating committee was accepted.

At 11.30 a. m. the section adjourned sine die.

## SECTION ON EXPERIMENT STATION WORK.

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AFTERNOON SESSION, WEDNESDAY, NOVEMBER 18, 1908.

### BOVINE TUBERCULOSIS.

Taking up the discussion of the first regular subject on the programme, viz. Bovine Tuberculosis and Methods for Its Control, V. A. Moore, of New York, read the following paper:

Your president invited me to discuss at this meeting the subject of "Bovine tuberculosis and the methods for its control." After accepting the task which this honor conferred, I found myself groping about for a system by which I could arrange the many integral factors involved in this important subject. In this search I was reminded of the trite saying of a wise man, "We can not use science till we know it," which suggested the plan I have adopted, and which, at the risk of being tiresome, I shall present as clearly and briefly as possible.

In discussing the control of this widespread disease we are at the beginning met with many methods incorporated in laws, ordinances, and professional and private practices which have been and are being applied with more or less success. The failure of the unsuccessful methods is to be traced to the lack of recognition in their formulation of the subtle habits of tubercle bacilli. It seems fitting, therefore, that we should consider first the status of our knowledge of this affection, in order to ascertain if we know what is necessary to be done to defeat the spread of the disease by its natural methods and to determine if possible what part, if any, the individual owners of cattle take in its dissemination.

If one considers the bovine tuberculosis situation in this country from the point of view of control, he is at once confronted with a series of questions the answers to which must, from the very nature of the problem, be his guide in formulating methods of procedure. These questions and their answers will therefore serve as the plan of my discussion. In propounding them I may seem to deal with too elementary topics, for I recognize that I am, before this audience, privileged to assume a very general and accurate knowledge of the known facts regarding this great scourge of cattle. However, the philosophy of science teaches that it is the interpretation and correlation of results, as well as the isolated facts themselves, that aid in the answer of difficult and complex questions.

If, then, we are to find a solution for the intricate problem of eradicating bovine tuberculosis, we must view the entire subject as it is, stripped of all artificial settings and relieved of all false interpretations. In order to have a clear understanding of the phenomenon itself we must ask the scientific investigators, What is tuberculosis; where does it come from; through what channels does it spread; how can we detect it, and what can be done to control it? I dare say the answers to these questions seem simple, but I must ask in that connection if, in the multiplicity of unsuccessful efforts to control tuberculosis, the natural history of the disease itself has been fully recognized and taken into account?

The results of the most careful investigations show that tuberculosis is a parasitism resulting from the multiplication within the animal tissues of tubercle bacteria. We have, then, two distinct subjects to deal with, namely, the host, in this case cattle, and the parasite, in this case tubercle bacteria. To appreciate what tuberculosis is, therefore, involves an understanding of the reaction of the tissues of the cattle to the parasites and of the life history of the

bacteria in so far as it affects their ability to invade the tissues, to cause them to react, and finally to escape from the infected individual in order that they may invade other animals lest they perish with the death of the present host. The lay literature on this subject conveys the old idea that the disease is an entity and not the final result of the struggle between the invading bacteria and the living animal in which the bacteria are being victorious.

If we examine into the ways and means by which bacteria produce disease we shall find that there are two extreme methods with intervening grades. These are (1) where the organisms themselves produce a poison which destroys their host, and (2) where the bacteria, multiplying locally within the body, stimulate tissue reaction and finally destroy the organs. The first is illustrated by tetanus and diphtheria, which kill quickly, and the second by leprosy and tuberculosis, which act very slowly and kill when they have destroyed tissues necessary for the life of the individual. The time required to accomplish this depends upon the location to which the bacteria have been taken in the body. This partly explains why the disease in an individual infected with tubercle bacilli may run a rapidly fatal course, or the individual may live for years, exhibiting few if any symptoms of the affection.

The means by which the bacteria become disseminated from the primary focus within the body and the resistance of the tissues to their invasion are not only interesting topics but also essential to the understanding of the oscillation between the active and the arrested state of the disease. A knowledge of the means of dissemination of the bacteria in the body is also necessary to appreciate the naturalness of generalized cases springing from local ones, of rapidly fatal cases and very chronic ones. These are questions in pathology that we have not time to discuss, but which have been worked out and explained by the resistance of the tissues or immunity, the virulence of the invading bacilli, the physical means for their dissemination within the body, and the specific reaction of the tissues to the invading organisms. While this knowledge may not seem necessary for formulating methods of control, and while it is not if a system of cattle extermination is adopted, the basis of a rational method for economically weeding out the infection must be a knowledge of what the infection really is.

The question, Where does tuberculosis come from? is for our purpose fully and accurately answered by saying that it grows up with the tubercle bacilli that escape from the bodies of the diseased animals and that gain entrance into the tissues of well individuals. Where the tubercle bacilli originated we have no knowledge, but they exist to-day as definite parasites on animal tissues and they must be dealt with as such. We are aware that there are great differences in the disease-producing powers of different varieties of tubercle bacteria, and that there are organisms quite common in nature resembling these in their morphology and staining properties. These are suggestive of important evolutionary theories relative to their source, but at present the tubercle bacillus seems to be as distinct and definite a species in the organic world as any plant. It is not known to multiply anywhere in nature excepting in live tissues. It will live, however, under favorable conditions for a considerable length of time outside of the living body.

Knowing the cause of tuberculosis to be a definite species of bacteria, the life history of which is fairly well known, the answer to the question, How is tuberculosis spread? is not difficult, for its propagation depends entirely and absolutely upon the transmission of the tubercle bacteria from the diseased animals to the susceptible healthy ones. In cattle the disease manifests itself in a variety of forms, but in the end the bacilli escape with the natural discharges of the body. In large numbers of infected animals the lesions are so located that the virus is not given off for a long time, and in many cases probably never. If the lesions are discharging into the respiratory tract, the specific bacteria escape through the mouth, some are scattered by the saliva, others are swallowed and escape with the feces. If the digestive tract is involved, the organisms are discharged directly into the intestinal canal. If the lesion is located in the udder, the bacilli find their exit with the milk. If they escape from the lesions into the systemic circulation, they may possibly be carried to any of these doors of exit. After being expelled from the infected body the bacilli find themselves in feeding mangers, stable gutters and yards, on the surface of water in drinking troughs, and in the milk. From these places they are taken up by other cattle that feed or drink after the infected ones, and by calves and pigs that are fed with the milk. It is not difficult, therefore, to understand how the disease may propagate itself when once introduced into a



herd, or how the specific bacteria may gain entrance to sound herds through the introduction of a tuberculous animal or animals or by feeding the raw milk from infected cows to calves.

As tuberculosis is an insidious and slowly developing disease, which has been spreading in our cattle with little interference for centuries, its germs have found their way into many unsuspected individuals. In some of these the disease is in the period of incubation; in others its progress has been arrested. The number of such animals in the different herds depends upon the length of time the infection has been present and the number of animals that are spreading the virus. These apparently well but actually infected animals can not be identified from their appearance. They are, like the "germ cases" with certain human diseases, dangerous individuals, and they add difficulties to the methods for elimination that have not generally been reckoned with.

Whatever theories are entertained concerning tuberculosis, the facts are that it is a disease slow in its development and impossible to detect in a great majority of cases by ordinary methods of examination. As the unrecognized as well as the obvious cases harbor the germs and may be the disseminators of the same, it is very important that they should be detected. This brings us to the methods for diagnosis. Medical science teaches that the nature of an infectious disease can usually be determined in the living animal by (1) the symptoms or manifestations, (2) the discovery of the specific cause, and (3) some specific reaction. The wide experience of many carefully and scientifically trained veterinarians has shown that but a very small percentage of the tuberculosis-infected animals can be detected on physical examination. The search for tubercle bacilli in the natural discharges of the body has shown that this method of diagnosis is not practical or possible in a large majority of cases. This leaves us but one other method for detecting the presence of tubercle infection, namely, a specific reaction.

In 1890 Koch pointed out that there was a specific reaction produced in the case of tuberculosis when the infected animal was injected with a small quantity of a sterilized fluid in which tubercle bacilli had grown, or tuberculin. The discovery of this reaction gives us a means by which we are able to pick out the individuals that have become hosts of this bacterial parasite.

The assumption was, and the opinion is still generally entertained, that tuberculin will cause a reaction in all infected animals. Unfortunately, like other reagents, it has its limitations. Tuberculin does not give a reaction during the period of incubation; this is also true in many if not all cases where the disease is arrested, and possibly when it is very advanced. This means that the records of tested herds do not necessarily point out all the animals that are infected or those which may subsequently develop the disease, but simply those that are suffering with a progressive form of tuberculosis. The recently infected and latent cases can not be detected until the disease becomes active. To catch them early requires repeated tests. The length of the period of incubation is uncertain, and it is not known how long the lesions may lie dormant. We have cases where they seem to have sprung into activity after three and one-half years, and also a case where an apparently healed, calcified tubercle contained living, virulent tubercle bacilli at the end of three years. It is the cases that could not react and that were left in the herd that have caused tuberculosis to reappear in many herds after the reacting animals have been destroyed. The owners are often inclined to blame the tuberculin. The fault is not with the tuberculin or its first application, but in the failure to make the necessary subsequent tests.

Further, it has been shown repeatedly that a considerable number of animals that react to tuberculin do not respond to subsequent tests. Many of these arrested and apparently healing cases react later. When opportunities for reinfection are not in evidence this subsequent reaction is attributed, though this is not proven, to the latent form springing into activity. Undoubtedly a goodly number of animals that become infected recover, as with man. These phenomena, which have been carefully observed, illustrate the constant changing of the lesions in the animals where the struggle for supremacy is active between the tubercle bacteria and their hosts. Much additional investigation is needed along these lines.

The question of how tuberculin acts has been a subject of much investigation. Its use has demonstrated three distinct and interesting phenomena: First, a marked sensitiveness of the tuberculous individual and a comparative indifference of the healthy body to it; second, a distinct thermal reaction of the tuberculous individual, that is, a general effect; and third, a hyperemia of the tuber-

culous focus. These can be demonstrated in the tuberculous guinea pig; but the explanation for the rise of temperature in the tuberculous body following the injection of tuberculin has not been easy to determine. A number of explanations for this have been offered, but the one first suggested by Eber some ten years ago and recently modified by Theobald Smith seems to meet the conditions better than any of the others. It is as follows:

"In the tuberculous tissue and its immediate vicinity the tubercle bacilli have induced certain tissue changes, and with them certain new functions of the tissue have been aroused which are the result of immunization. These new properties are concentrated in the immediate neighborhood of the focus. The specific resistance is, as it were, chiefly focal and only secondarily generalized. When the tuberculin comes in contact with the focus, the former is acted on with the result that the originally innocuous tuberculin becomes poisonous, perhaps, by the splitting off of some poisonous substance. An incomplete digestion, I should prefer to call it. As a result of this we have, first, the local hyperemia, and, second, the constitutional effect. In other words, the tuberculin becomes poisonous by immune reaction directed toward the tubercle bacilli. This reaction is defective and in so far dangerous to the host. The only way in which the danger can be met is for the body to produce an antibody to the second substance. So far there is little evidence to show that the body is able to produce this in any amount. The animal body has learned to protect itself by suppressing multiplication rather than by attempting to neutralize such poisons."

A study of the structure of tuberculous lesions shows that when the process of healing begins there is formed about the foci a wall of cellular or fibrous, or fibrous and cellular, tissue which tends, to a certain degree, to separate the diseased area from the surrounding tissue and circulation. The specific product resulting from the tissue changes, as stimulated by the tubercle bacilli in the focus, is therefore largely confined to the diseased area and can not act upon the tuberculin if it is subsequently injected. This explains the failure of tuberculin to react in those cases where tubercles are healing. As a small part of the specific product of the tubercle may be disseminated in the circulation or surrounding tissues, and as its elimination may be slow, it is not unlikely that the partial reactions that often occur may be explained on the hypothesis that there still remains enough of the specific substance to disturb the temperature, but not to cause a characteristic rise. More extended investigations are necessary to determine at what stage in the healing process reaction ceases either in part or completely. It is presumable that a number of conditions contribute to this result. In an experiment with 17 tuberculous cows, 12 failed after a certain time to react. The post-mortem examinations revealed lesions that were small and few in number, and in all cases but one they showed evidence of healing. In four of the five animals that reacted, quite as much reactionary tissue existed about the tuberculous foci as there was about those in the animals that failed to react. In other words, the line of demarcation between the lesions in animals that react and those that fail to do so is not always apparent. Because of the unrecognized limitations of tuberculin, results have been accepted as failures when the condition of the tubercle itself was such that the tuberculin could not cause a reaction or when the reactions have occurred before the lesions were of sufficient size to be readily found. Again, failures have been reported when the lesions were not detected in the viscera and where the intermuscular tissue, bones, and nervous system, which are occasionally the seat of the primary lesions, were not examined.

#### THE CONTROL OF BOVINE TUBERCULOSIS.

The vital question for the cattle owner is, How can tuberculosis be prevented or eliminated? If I have been clear in pointing out the nature of tuberculosis, it is evident that the problem of control must be solved the same as other problems of a biological nature. As tuberculosis appeared in cattle early in the history of the species, it had a long time to become disseminated through its natural channels of transportation and transfer before it encountered the hostile activities of preventive medicine. Yet the history of the disease shows that in many countries, such as Denmark and Sweden, it did not exist until it was introduced with infected animals. More than this, in countries where it now prevails extensively there are many uninfected herds. The efficiency of the natural forces to spread the virus has been heightened during recent years by the steady increase in cattle traffic, especially in dairy districts. Individual dairy-

men have bought and sold cattle regardless of this infection, thereby introducing it into thousands of herds that by nature's method of disseminating the bacilli would not have become infected. We are at once confronted, therefore, by the situation in which the natural powers for the dissemination of tubercle bacilli have been and still are being accelerated by the habits of the dairymen. The problem of control is a complicated one, because the spread of the virus through these natural channels must be checked and the habits of the dairymen so adjusted that they will tend to prevent rather than enhance the spread of the specific bacilli. Again, the problem is complicated because the infected animals possess a greater or less intrinsic value. Methods for control should provide not only for checking the further spread of the virus, but also for the utilization of the infected individuals. The subject becomes further subdivided because of its sanitary significance as well as its economic importance.

The results of the investigations into the presence of the bovine variety of tubercle bacilli in cases of tuberculosis in man have shown that a large percentage of glandular tuberculosis, especially in children, is caused by the bovine variety. This places its sanitary significance on a more definite basis and points conclusively to the fact that we do not want for human consumption the milk or products of tuberculous cows.

The economic problem is many sided. In some instances whole herds are infected. These are frequently the only source of revenue for their owners. Large numbers of these cattle are suffering with single or localized foci of the disease, which leave the carcass fit for food. Our Government inspectors pass for sound beef thousands of animals so affected every year. Again, there are many herds of cattle valuable for their pure blood or special strains that have been obtained after years of expensive effort in breeding. These have a value to the dairy industry that is difficult to measure. Many of these herds may be tuberculous. We know that some of them are. Of the infected individuals a very large percentage are but slightly diseased. However, because of this infection they are a menace to the healthy animals, but most of them still possess their essential value, the ability to breed. These can be segregated and their offspring procured free from the taint of tuberculous parasitism with which their dams are suffering. The Bang method, which has been successfully and extensively applied in Europe and in many herds in this country, provides for a safe and economic handling of this class of animals.

The control of a disease like tuberculosis after it has become widely disseminated is difficult because of its insidious and parasitic nature. The purpose is to detect the infected individuals, but to do this we must recognize the course of the disease in the animal body and the limitations of our means for detecting it. The mere testing of large numbers of cattle with tuberculin requires much time and many men. Its application must be repeated to detect the cases of active disease that are very likely to develop from the latent ones that escape detection on the first test. The men who apply the tuberculin should be trained and competent or the results will be untrustworthy. The use of tuberculin is comparatively recent and generally not well understood. It is too sensitive a reagent to be trusted to the unskilled. An equitable and just disposal of the reacting animals must be provided for. The cooperation of the owners must be secured, and they must be taught the nature of the disease and its disastrous effects upon the herd if allowed to continue unchecked. State and municipal meat-inspection services are a necessary complement to afford a ready and legitimate exit for many reacting animals. The whole proposition is complicated. However, the principle of segregation—to prevent the further spread of the virus—is clear, and its application is not necessarily difficult. If the spread of tubercle bacilli could be stopped, as it is possible, tuberculosis would disappear with the present infected individuals. Because of the great values and the large number of animals involved and the necessity of supplying a constantly increasing quantity of milk, new dairy methods are necessary to meet the present conditions. Dairymen must raise more calves and buy fewer milch cows, unless they can be assured of sound herds to purchase from. The herd is the unit to be considered, not the individual animal. These are among the details that must be formulated by those having in charge the work of eradication in different communities.

The dairymen are looking to the professional men, the experiment stations, and State colleges for a remedy. The procedure recommended must, if successful, take into account nature's methods for maintaining and disseminating tubercle bacteria. If nature's methods here are objectionable or destructive to man's best interests, as they are in reference to many other conditions, then



it is for the scientific investigator to ascertain how these natural forces may be directed so as not to infringe upon man's rights, or the agencies through which they operate must be eliminated. The analysis of the problem shows that we must deal (1) with what tubercle bacilli through their natural channels can and will accomplish if undisturbed, and (2) what cattle owners are doing to enhance the normal means for their distribution.

In this warfare the responsibility of the individual cattle owners must not be overlooked. The obligation to the producers of the consumers, who are clamoring for pure milk, must likewise be recognized. While we are educating the farmer that he can not afford to have tuberculosis in his cattle and teaching him how to free his herd of this parasitism we should be instructing the consumers that a pure milk can not be produced for the same price that an infected, dirty milk can be sold for.

As the prevention of bovine tuberculosis rests almost entirely with the cattle owners themselves, who will be successful according to the extent to which they adhere to the knowledge of the disease itself, and as this knowledge has and is being given to them in bulletins, agricultural papers, and lectures, the question of how long the State is going to compensate owners for tuberculous cattle as an aid to its elimination is an important one. There is a feeling developing that the State should not compensate owners for tuberculous animals. In New York the compensation for such animals has recently been increased, but the question whether such a law is right is being discussed in many quarters. The question, Why should a man be paid for a tuberculous animal any more than for one dead of anthrax or any other disease? is being asked repeatedly. In some States there is no compensation, and in certain States where there is, its discontinuance is being urged. The tendency seems to be that payment for such cattle from public funds is not to last.

If we are to be more specific in outlining general methods of procedure and to specify what should be done to minimize bovine tuberculosis, it would seem that the following suggestions might be considered:

(1) A campaign of education should be carried on in which the cattle owners are instructed (a) in the kind of a disease tuberculosis is and what is necessary to prevent or eliminate it, and (b) that a farmer can not afford, for financial reasons alone,<sup>a</sup> to have tuberculosis in his herd.

(2) Such regulations and laws should be secured and put into force as may be necessary to prevent any and all actions<sup>b</sup> on the part of the cattle owners and dealers that will tend to disseminate the disease.

(3) Every possible means should be provided for assisting owners of infected cattle to recover the actual value of the diseased individuals. This requires efficient meat-inspection service, and regulations and laws, if necessary, to permit of the conservative handling of infected herds.

(4) Owners of infected herds should be encouraged and assisted as much as possible in methods for building up sound herds with the offspring from their reacting animals.

(5) Dairywomen should be instructed in the danger of purchasing cattle from infected herds. The herd, not the individual animal, should be considered as the unit to be dealt with. The maintaining of sound herds from which dairy cows can be purchased is an important part in minimizing bovine tuberculosis.

(6) The separated milk and whey from creameries and cheese factories receiving milk from tuberculous cows should be pasteurized or sterilized before being fed to calves or pigs.

(7) An animal that gives a tuberculin reaction should thereafter be considered as an infected individual and never be placed in a sound herd.

Just what the particular regulations shall be can not be specified in the abstract. The conditions vary in different herds and the remedy must be ad-

<sup>a</sup> Doctor Melvin, Chief of the Bureau of Animal Industry, estimates that the annual loss because of tuberculosis among farm animals in the United States is not less than \$14,000,000.

<sup>b</sup> In New York it is a violation of the law to sell diseased animals, unless the purchaser has full knowledge of it. The law in New York, enacted in 1908, states that "no person shall sell an animal known to have a communicable or infectious disease except for immediate slaughter, unless such sale be made under a written contract, signed by both parties, specifying the disease with which the animal is infected, a copy of which shall be filed in the office of the commissioner of agriculture."



justed to the individual cases. The natural history of tuberculosis indicates very clearly that it can be eliminated, but that eradication can not be accomplished quickly. The experience with many herds, where the infection existed to a fearful extent, shows that such results can and have been obtained. Never before have men been called upon to formulate methods for eradicating a widespread disease where the infected animals still retained an intrinsic value for food or breeding purposes. While this complicates the problem it adds interest to it. It brings us face to face with a great necessity for an application of technical biological knowledge to a great human industry. Problems as difficult have been solved, and man, in his wisdom, can elucidate this. The great Pasteur said on one occasion "that it was within the power of man to eliminate the infectious diseases from the face of the earth." That statement should be accepted with full faith in reference to bovine tuberculosis.

H. L. Russell, of Wisconsin, spoke as follows on The Relation of Dairy By-Products to the Spread of Tuberculosis:

#### THE RELATION OF DAIRY BY-PRODUCTS TO THE SPREAD OF TUBERCULOSIS.

In attempting to combat any contagious disease, it is of the utmost importance that we realize the exact method of transportation, of communication, which that disease possesses. And in our study of the tuberculosis problem it is especially important because of the insidious nature of this malady. Now, without going into the finer scientific details, it may be stated that there are two main methods whereby the disease is introduced into our herds, one through the medium of purchase, which Doctor Moore has already referred to, and the other through the medium of infected dairy by-products.

In our experience in Wisconsin two-thirds of all the herds in which tuberculosis was found show that that disease had been introduced by purchase; or at least this is true, that of the herds which were found infected two-thirds had animals introduced into them that were affected with the disease. So that the practical solution of this problem will turn very largely, indeed, upon how we handle this aspect of the case. If it were possible for us to guarantee the healthfulness of stock that was sold, it would be possible for us to stop the further spread of tuberculosis, and that is by far the most important aspect of the question.

The phase of the question, however, on which I have been asked to speak a few words to-day is the other side, viz, the infection which may come from skim milk, whey, or creamery by-products. It may include buttermilk, it may include centrifuge slime or whey. The centrifuge slime in this country is very rarely used for feed. In some of the dairy regions of Europe this material was used, and it was found to be the means whereby the disease was rapidly disseminated in Denmark.

Now, of these two methods of distribution—distribution by purchase and distribution by creamery by-products—the first must always precede the second.

You can not have the creamery skim milk involved unless there is tuberculosis in the herds that contribute the milk to that creamery. The way they get infected is generally by purchase. So the first method starts the disease; then it goes on developing within the herds until a point is reached where the milk becomes infected, at which time the spread of the disease is frightfully rapid. You might compare the infection by purchase to the sharpshooter, who picks off one man at a time; infection by creamery by-products to the explosion of a shell, which will deal death and destruction as far as its fragments carry. It is of special importance that wherever we can find illustrations of this character they be worked out.

I had opportunity last year to secure data in two or three instances that were exceedingly striking in character, and which are reported in a bulletin of

the Wisconsin Station.<sup>a</sup> The examination of a number of herds revealed the fact that an unusually large percentage of animals had tuberculosis; and what was more striking was that it was the young cattle that were infected. Usually tuberculosis is more prevalent with mature animals, and this fact at once aroused suspicions that the cause of infection here was a different type from that which ordinarily obtains. Starting on the hypothesis that the dispersion of the disease was through the medium of skim milk, we encouraged general testing. In one of the creamery districts thirty-odd per cent of the animals were found to react to the tuberculin test, in the other 25 per cent. An attempt was made to secure the same kind of history in the surrounding creameries. Those that were immediately contiguous had only 10 per cent; those in the vicinity, but not immediately contiguous to the territory, had 8 per cent. In most instances the reacting animals were found to have been introduced from outside districts.

Here and there were individual herds in which no diseased animals were found. Where such were found, it was due to people who had just moved into this section. Where the farm separator was used and the patron took only the cream to the factory the animals were free from tuberculosis. In one striking instance the owner brought back only sufficient skim milk for one calf in a herd of 50 or 60, and that was the only animal which had the disease. We have here, therefore, a most striking illustration as to how the creamery skim milk may be the means of spreading the disease.

Those of you who live in regions where there is a small amount of tuberculosis will not find a large number of cases of this sort. But in those older districts, where factory dairying has been carried on for a long time, the danger of this method of dispersal is very greatly increased.

How does the milk become infected in this way? Our notions in regard to this phase of the question have undergone a marked change in the past few years. Prior to a few years ago it was assumed that the infection of skim milk arose almost entirely from an infection of the milk in the udder of the animal itself. Another phase of the question has been brought out within the last two or three years—that is, a possibility of the infection of the milk through infected feces. Our notions in regard to the spread of contagion from this source have undergone radical changes. The tenets that were held universally a decade ago, that the disease was introduced by inhalation, by inhaling the dry bacillus, which was taken into the lungs, no longer receive the attention that they received a few years ago.

The other theory, that of ingestion, that the bacilli pass into the body tissues through the medium of the alimentary canal. is now strongly supported by most bacteriologists, and the evidence of the last few years proves, it seems to me, overwhelmingly that that is the probable way in which the infection generally occurs. The air may be a medium for the dissemination of the disease. If a person inhales the dried bacillus, it may not go into the lungs immediately; it will lodge on the mucous membranes, and by swallowing may pass into the digestive tract, not going into the lungs directly.

In fact, there is every reason to believe that ingestion of the tubercle bacillus through the medium of the alimentary canal is by far the most fruitful way in which the organism finds its way into the body of the host. This being true, we have through ingestion a possibility of infection from milk, where the origin may be either from infected skim milk coming directly from the body of the animal or contamination from fecal discharges.

<sup>a</sup> Wisconsin Sta. Bul. 143.

So far as infection through the udder is concerned, the percentage is relatively small. The experience of post-mortems indicate that there is not a large percentage of animals which have tuberculous udders. Wherever a tuberculous udder does exist you have a very high state of infection, and the milk of one animal diluted many times will still contain the seeds of infection to such an extent that other animals will acquire the disease from that kind of ingested milk. Just how far we do not know, because the statistics are exceedingly unreliable, but in any event it is relatively small. There is, however, no doubt, from the considerable body of evidence which has been collected, that the feces of the animal may be highly virulent. The readiness with which fecal matter finds its way into the milk supply makes it easily possible for infection from this source to occur. In both of these ways, in the latter probably more than in the former, milk acquires infection and the disease may be transmitted.

The animals particularly infected in this class are calves and hogs; and when we take the Federal statistics that have been collected at the meat-inspection plants it is evident that an enormous increase in tuberculosis in swine is occurring. It is true that tuberculosis is present in cattle, but it is only small compared with that of hogs. In 1902 one hog in 1,700 and one in 715 of cattle were condemned. In 1907 one out of 250 cattle was found to be tubercular, and one in 70 of swine, an increase in swine from one in 1,700 to one in 70.

Now, gentlemen, that means a serious economic problem which confronts us. The question of tuberculosis in hogs will, in the next decade, be a more important one than tuberculosis in cattle. In dealing with this question we must strike at the fountain head of the source if we are going to have any effect.

There is no animal which possesses a degree of susceptibility equal to that of swine. We look upon the cow and the guinea pig as animals readily acquiring tuberculosis, but a hog is infinitely more susceptible by methods of feeding. So that wherever swine are fed milk which possesses the slightest taint of tubercular infection the chances of the disease being produced are very great indeed.

In order to show a few cases of this from my own records I present the following:

One instance which came to my attention two years ago was a herd in which a large percentage of infection was found—over 50 per cent. The herd was handled on the Bang system. The calves were kept apart and fed on what was supposed to be pasteurized milk; but by reason of leaving it to the hired help the method of pasteurization was not effective, for out of 22 of those which were fed on what was supposed to be heated milk, but which was found to be only warmed milk, 12 acquired infection within a year's time. All calves on post-mortem showed mesentery infection.

In another herd of 175 animals, 75 animals were found to react to the tuberculin test. For a while the hogs, which were kept entirely separate, were fed skim milk from the herd. Among the hogs were a number of brood sows, and these brood sows perpetuated tuberculosis over a period of two or three years. The man cleaned out his cattle barn and stopped the disease by the Bang system, but he had placed his young calves in the hog house, and nearly all of them contracted the disease from the hogs. When the chain of circumstances was explained, I told him the cattle must have gotten the disease from the hogs and the hogs were infected from the original herd by feeding them skim milk. To test the accuracy of this hypothesis, several of the hogs, which were apparently well, were killed, and three out of four showed the presence of the disease, indicating that the disease had gone from the cattle to the hogs and



that the brood hogs had perpetuated the disease, infected the quarters, and given it to the calves, so that the disease was transferred from bovines to hogs and back to the bovines again.

Another instance which has come to my attention this past year is in the case of a certain industry in Jefferson County, where the manufacturer buys his pork for the making of a special brand of sausage—a very high-grade sausage, made out of selected pork, 100 to 125 pounds in weight. The dealer had gone out and personally selected hogs kept and cared for by people he knew; therefore it represented a localized industry. The great difficulty in tracing tuberculosis in swine is that the identity of the hog is lost when it goes to Chicago or the large packing centers; there they are mixed up, and the inspectors have no means of ascertaining just where these infected hogs may come from. This case permitted tuberculous hogs to be traced with great accuracy. In 1907, among those who sold to the company, 10 farmers delivered tuberculous hogs; last year, out of six or seven thousand hogs purchased, 100 farmers delivered tuberculous hogs; so that you can see the spread of the disease in that small district.

I found in some cases that a considerable number of patrons having tuberculous hogs came from one creamery district. The probabilities are the creamery skim milk of that district was the means of spreading the disease.

If it were possible for us to get at the origin of the disease in swine, it would enable us to trace this whole matter of the distribution of tuberculosis with greater accuracy than in any other way.

Rogers, of Kansas, has suggested the plan of tagging live stock, so that it can be followed from the farm to the packing house, and it can be ascertained whether A's, B's, or C's animals were infected or not. This meets with opposition, of course, but you can see when we have an animal like the hog, which is the most sensitive, the most susceptible animal we possess, when we have that animal tagged from the farm to the packer it enables a history of the case to be traced with even greater accuracy than would be the case if the tuberculin test itself were used. I believe the hog can be used in certain regions to determine the tuberculous estimate of that locality. In Kansas, Nebraska, and Missouri, where the fattening of animals is carried on so largely, there is no better way in which to determine whether steers were tuberculous or not than by noting whether the swine following them have the infection.

There is a golden opportunity for the United States Department of Agriculture to carry on a very valuable line of experimental work. They have all the machinery, and in a comparatively short time all this data could be secured which would answer this question better than in any other way.

The question of the prevention of this disease through the medium of skim milk is the practical essence of this problem. There are two methods which can be readily followed. One is the introduction of a hand separator. If a man is carrying to the factory simply the cream and leaving his own skim milk at home, then all you have to know is whether your own herd is free from the disease, and you do not have to bother with anybody else; so that the use of the farm separator prevents the dissemination of the disease. We had one agent for hand separators tell us that we were his best advertising medium, because of this work on skim-milk infection.

The other method is the treatment of skim milk, or the whey of the factory, in such a way as to destroy the seeds of disease. That can be readily done by the process of pasteurization. A great many of our factories are already introducing pasteurization to improve general conditions. If you couple with that the effect which proper pasteurization would have upon the danger of spread-



ing tuberculosis, you have a reason which should make it obligatory to see that compulsory legislation is passed with reference to this. Two or three of our States have already advanced sufficiently to have placed on their statute books a law which requires all the skim milk to be pasteurized—Minnesota, Iowa, etc.

Theoretically it would not only be desirable to have all the skim milk, but all the whey—in fact, all the wastes of our dairy factories treated at a proper temperature to destroy all bacilli. If you do that you destroy all danger. I fed last winter to one batch of hogs skim milk not heated, to another skim milk heated to 161°, and another at 176° F. for a momentary exposure. In not a single case did the hogs which were fed the heated milk have tuberculosis, and in every case the animals fed on the unheated milk had the disease in an aggravated form. So that the heating of the milk will certainly stop the disease.

We can not heat all of these by-products with safety. You can not heat buttermilk without curdling the whole mass. About 10 per cent of buttermilk can be mixed with skim milk and heated with safety, but when you get beyond that proportion you can not do it with safety. We can better afford to lose this material than to let unheated products get back to the farms.

In compulsory legislation we must have some reliable method of testing, and we have in Storch's test, which is universally used in Denmark, a means which can be put into an ordinary factory operator's hands, a method requiring no technical laboratory experience, and in a minute's time it can be ascertained whether the milk has been heated to a proper degree to kill the tubercle bacillus or not.

New York, Wisconsin, Minnesota, Iowa, our great dairy regions, should have such legislation as this to prevent an infection which may come through the factories in this way.

Not all of these regions are in an infected state in which the disease is sufficiently abundant to permit the spread of the disease in this way, but no one can tell when that condition is going to occur. If you are in a section where the dairy industry, especially factory dairying, has been actively carried on twenty-five years or more, there are doubtless here and there foci in which the skim milk is dangerous, and in such you have the disease spread with unparalleled rapidity.

H. A. Harding, of New York, presented the following paper:

#### THE BANG METHOD OF CONTROLLING TUBERCULOSIS.

The watchword in the modern struggle against infectious diseases is "prevention." One of the first to successfully apply this principle to tuberculosis in cattle was Dr. Bernard Bang, of Copenhagen, Denmark. The simplicity and effectiveness of his manner of application has attracted world-wide attention, and the plan which he has followed is commonly referred to as the Bang method of combating bovine tuberculosis.

A close inspection shows that this Bang method is not an ironclad form of procedure, but rather the orderly application of certain fundamental principles which are to be applied as fully as the circumstances will permit. The more fully they are applied the more thoroughly successful the result. These principles, which underly any intelligent attack on this problem, have already been presented at length by Doctor Moore, and their manner of application is all that needs mention in this connection.

I think that it has been made plain to you that tuberculosis is an infectious disease. Also that the germs of bovine tuberculosis are not ubiquitous, but are distributed, in the main, by those cases of open tuberculosis which can be most easily recognized; that is, those having tuberculosis of the udder and showing demonstrable germs on microscopical examination, and those having pronounced physical symptoms which may be recognized by physical examination. In beginning the application of the Bang method to a herd that is known to be tuberculous the first step is to recognize and dispose of those cases of tuberculosis which are disseminating the maximum amount of infectious material.

Practically all of the calves of tuberculous cows are born healthy. All of the calves from this old, tuberculous herd should be separated from their mothers after the first day, and kept entirely separated from the diseased herd. These healthy calves form the beginning of a sound herd. All the milk fed them should be from healthy cows or should be heated sufficiently to remove the danger of transferring disease germs. There are practical difficulties in maintaining a perfect separation between two herds on a single farm, and the heating of the milk for the calves is not always efficiently done. Infection will be occasionally transferred to this sound herd, and it should be tested with tuberculin every six months for the purpose of detecting and removing any animals which may have contracted the disease. The formation and protection of this sound herd is the second and most important step in the application of the Bang method.

The constant repetition of these two steps, the removal from the old herd of the cases which are most active in the spreading of the disease, and the protection of the growing, sound herd from infection, means steady progress toward the complete solution of the tuberculosis problem. In this way all of the value which is in the old herd is conserved, and they are disposed of at the time when they become a serious menace to their associates. At the same time, if the spread of the disease can be stopped, the natural increase will replace the old diseased herd with a young sound one in four to six years.

You naturally ask how this plan works in practice. It has been tested under such a wide range of conditions that its efficiency, when properly followed, may be considered as fully established.

It was first put to the test by Doctor Bang in 1892 and it has since been tried on some thousand farms in Denmark. The number of reactions in the sound herd, when employing this method, have been directly proportional to the care exercised by the attendants. On the large estates, where the question of efficient supervision was a difficult one, the reactions were more numerous than on the smaller farms, where the owners personally attended to the cattle. When the conditions were under proper control reactions in the sound herd were rare.

The general conditions of the cattle in Denmark with regard to tuberculosis have been so much improved since the introduction of this method that whereas the results in 1893 from cattle tested with tuberculin indicated 40 per cent of tuberculosis among Danish cattle, the returns for 1907 on a like basis indicate only about 10 per cent.

Similar tests of this Bang method in Hungary, Norway, and Sweden have shown similar satisfactory results.

Turning to our own country, this method was put to the test in Wisconsin by Doctor Russell in 1896. He began with a herd of 16 reacting animals and 18 healthy ones. The two herds were kept in a single stable and direct contact was prevented by a wooden partition placed across the stable. At the end of three years there had not been a single case of infection in the sound herd, and during this period the 16 diseased animals had become the progenitors of 38 healthy calves.

A later application of this method was made at the Geneva Station. In October, 1901, of the 30 animals in the station herd 13 were healthy and 17 tuberculous. After four years of the application of the Bang method the station herd included 30 healthy animals which were descended from this original herd of 30, of which the larger part was originally tuberculous. During this four years the two herds were kept either in the same barn or in closely adjoining buildings and were cared for during a part of the time by the same attendants, and yet but two cases of infection occurred in the sound herd during that period.

Doctor Moore has applied this method in a number of private herds with marked success.

There can no longer be the slightest doubt that practically any tuberculous herd may be replaced by a sound one through their healthy progeny within a comparatively few years. The real question is as to the difficulties to be encountered and as to the expense of the undertaking.

The greatest difficulty is to get the person in immediate charge of the herd to exercise the proper amount of intelligent care in regard to details. Carelessness in this respect may convey infection to the sound herd and much delay or entirely defeat the progress of the work. You all know how hard it is to maintain a constant interest in any form of work during a period of years, and a considerable number of failures are to be expected on this account. This

method can never be successfully made compulsory by law, because without the active and intelligent cooperation of the owner it would be foredoomed to failure.

The remaining difficulties are fundamentally financial ones. The Bang method, when properly applied, will produce a sound herd, but whether or no it will pay to make the application depends upon the expense incurred and upon the value of the resulting sound herd. In Denmark, owing to the assistance given by the State, this method is financially possible with practically any herd. Here, where the farmers are generally left to work out their own salvation in this matter, the expense is so much greater that it can not be ordinarily applied with profit except to herds of more than average value. The principal difficulties may be summarized as follows:

The first of these is as to the advisability of testing the old herd from which a physical examination of the animals or a microscopic examination of the secretions has led to the removal of the most dangerous cases of disease. In Denmark they take a very practical view of this situation and recognize the fact that the bulk of the milk in the market, even of that for direct consumption, contains the product of tuberculous cows. Under such circumstances no particular odium rests upon the farmer who knowingly furnishes milk from tuberculous cows, but he is rather given his just due of credit for removing from his herd such cows as are most liable to infect their product with the germs of disease. Even in Denmark not all herds are found to be infected; but in herds where the disease has become thoroughly established about 80 per cent of the mature cows react sooner or later. Under such circumstances, and principally because he does not consider that such herds contain sufficient sound material to justify the attempt to save it, Doctor Bang recommends that the mature cows should not be tested, in herds where a physical examination has showed the presence of considerable tuberculosis, but that the nucleus of the sound herd should be taken from the young stock and calves.

With us there are sentimental, and, in some cases, legal objections to the continued sale of milk from tuberculous animals, even after it has been properly heated. This situation exists notwithstanding the fact that our present milk supply in the Eastern States is undoubtedly as largely produced by tuberculous cows as was that of Denmark ten years ago. This places a financial handicap upon the farmer who desires to clean up his herd as against his business competitor who is less progressive in this matter, and this handicap is so severe in some cases as to put the farmer completely out of business. On the other hand, many of our herds have been but recently infected, and where the entire herd is tested a large proportion of it may be saved. Moreover, reactions are practically certain to be met with in connection with the sound herd, and the question of utilizing the product of tuberculous cows will only be postponed, and not avoided, by not testing the entire herd. Where suitable provision can be made for economically utilizing the milk from reacting cows it is generally held that it is best to begin by testing the entire herd.

Another question which is always met with is that of providing quarters and attendants for two separate herds. This separation is naturally easiest and most complete when buildings on two separate farms can be used. On the other hand, this method can be successfully carried out, using a single stable and a single set of attendants, as was done in the experiment mentioned by Doctor Russell. It is noteworthy that in this experiment, where only a partition of single boards separated the two herds, not a single case of infection developed in the sound herd during three years. In all such cases where the two herds are to be handled in the same stable there must be a partition separating them, and the attendants should uniformly care for the sound herd before going into the part containing the diseased animals.

A prominent difficulty lies in the expense connected with making the tuberculin test. While there is room for extended argument as to the expediency or ethics of the State paying an indemnity for animals found to be tuberculous, there is little similar basis for an argument against the State paying the expense of making the tuberculin tests in cases where the farmers are striving intelligently to free their herds from this scourge. In the absence of State aid in this matter the individual, in most instances, must either do the testing himself or have the assistance of a veterinarian at a much more reasonable fee than is current at present. Both of these latter conditions are possible.

As matters now stand with us, there is perhaps no part of the application of the Bang method which occasions more trouble and expense than that of properly heating the milk so that it may be safely fed to calves or used as



human food. On most farms there is an entire absence of utensils for doing this heating economically and efficiently. The expense of procuring and operating these utensils on a single farm is such that unless the herd is of unusual intrinsic value it is not profitable to apply the method.

If I mistake not, the speaker who is to follow will present strongly the reasons why pasteurization should legally be made a part of the functions of the creamery and the factory. Not only is this desirable as a means of protecting the sound herds of the patrons, but it will so facilitate the application of the Bang method to the unsound herds as to make it economically possible to clean up all herds of even average value.

As has already been indicated, the cost of applying the Bang method varies widely with the conditions. Where pasteurization at the creamery or the factory is required by law and the tuberculin tests are conducted free of charge by the State, as in Denmark, the cost of applying the method is very nominal. The price of a partition across the stable, and that of the disinfectants necessary for treating the old stable, practically covers the expenses of cleaning up the entire herd. Accordingly, in Denmark, the method is economically applicable to all herds. With us, where the heating of the milk and the conducting of the tests is a private matter, the total expense is correspondingly higher, and the method can only be applied economically to a blooded herd or to one which represents the results of a number of years of careful breeding for a definite purpose. In Minnesota the milk is pasteurized, and in New York the State aids in making the tests. It is to be hoped that the general situation will continue to improve in these respects until our dairymen are given a fair chance to help themselves.

E. B. VOORHEES, of New Jersey. In our State we have been conducting work along these lines for about thirteen years, and we have attempted to emphasize the educational factor as well as to reduce the rapidity of the spread of the disease by destroying those animals which are likely to be sources of infection. In New Jersey owners are paid for destroyed animals. However, we are making little progress in eradicating the disease under the system followed. For example, we go into a section of the State, examine certain animals, and find 15 per cent tuberculous; along with that inspection we recommend that the barns be made more sanitary and that care should be made better. That same farmer is paid for all the animals destroyed in his herd, 75 per cent if the animal passes a veterinary inspection and 40 per cent if it does not. That man gets his allowance for the cows killed and he supplies that herd with other tuberculous animals, and in from three to five years his second condition is worse than his first. We go in and clean them up and pay him again. In five years more we go in and clean them up again. We are making no progress, and we have no compulsory methods whereby we can compel that man to follow the rules nor to prevent his buying tuberculous animals which will infect his herd again.

V. A. MOORE, of New York. I think that so long as the State is willing to pay for a person's cattle it will be allowed to do it. It seems to me the formulation of the rule here has got to be based in the first place on the general intelligence of the man in connection with it. Back of all of this is the moral standard. The first thing is education of the farmer to the point where he will understand he can not afford to have diseased animals. It has been my experience with a few private herds that if the herd is badly infected in the beginning you will get a good many reactions later from those that did not react at first. If there are few reactions in the beginning the chances are that they are all that are in the herd. It seems to me that the State should not take up the question of cleaning out tuberculosis in any herd where it does not complete the job.

If the State pays for testing herds and for the reacting animals and leaves some, it is at fault. The owner of a herd may be very careful about buying animals; he may not buy any; but in a little while animals that did not react to the first test begin to show the disease, and in a few years he has a bad herd. It seems to me that if the State is going to take hold of a herd, it should



follow it up carefully. It should retest it from time to time so long as there are animals belonging to the original herd and so long as the owner has complied with the regulations that the State lays down in regard to purchase. The State must stay by the matter until the original animals are cleared up; it will take four or five years to be safe, until a new herd has grown up. And when that time has come, if the State has had a good agent, the owner has been taught what tuberculosis is and how to deal with it. If after this he is found with tuberculous animals in his possession, they should be slaughtered at his expense. The State stays by him until he is cleaned up; after that it is his duty, as a citizen, to keep clean. How to bring this about by legislation I am not clear.

C. W. Melick, of Maryland, maintained that compulsory pasteurization of cream in creameries would be an effective means of preventing the dissemination of tuberculosis in the butter and buttermilk, and that it would be much easier to secure compulsory pasteurization at a creamery than it would be in a farm dairy.

C. D. Woods, of Maine, explained the Maine law providing for the testing of animals for tuberculosis by the cattle commissioners on request of the owners. The State pays one-half of the value of diseased animals. Another law makes it unlawful to bring any animals into the State which have not been tested with tuberculin. Still another law makes it unlawful to sell within the State any blooded stock that has not been tuberculin tested, and this has made a very marked advance, because we do not buy as much for breeding purposes outside of the State as we do within our own limits, and when we stopped selling young animals for bulls and stopped the selling of cows from farm to farm for breeding purposes we began to make a very marked advance.

H. T. FRENCH, of Idaho. We are just about to modify our live-stock law in the State of Idaho, which will provide for indemnity for slaughtered animals, believing that that will be the means of bringing to light cases of tuberculosis which are not now easily ascertainable. We are just going through the first outbreak of this disease that we know of; but we fear that there are cases in the isolated districts, and we propose now to modify our State live stock sanitary law so that we shall put an inspector in the field who will examine the dairy herds in particular, and we hope by paying an indemnity we shall be able to bring to light many animals not now easily found. This is warranted on the ground that, as in case of an outbreak of any contagious disease in human beings, the public insists in stopping the disease; that is, the population is taxed for that purpose.

H. L. RUSSELL, of Wisconsin. We have been in this work in Wisconsin for ten or twelve years, and have realized the necessity of taking hold of it, and have prepared a number of bulletins of a popular character, and have "bulletinized" the people, so to speak, we thought, in a fairly comprehensive way. It became evident, however, if we were going to solve this question we would have to solve it mighty quick, for the disease was spreading more rapidly than we were cleaning it out. We began to cast about for a way to obtain some speedy results.

Although numerous bulletins had been widely distributed, we were getting only about 1,000 tuberculin tests a year. Three years ago we began by holding post-mortem examinations on tuberculin-tested cattle at county fairs, before farmers' gatherings, before the legislature, before common councils of municipalities, and in every possible way trying to get the people to witness an ocular demonstration, so as to show them the ravages of the disease. The result of that post-mortem test was readily seen in the first year; instead of 1,000 we got 5,000 tests, and the next year 10,000, and last year we had 30,000.

We showed the farmer that the question of tuberculosis was an economic problem: that he had to take hold of it for the sake of his own herd. The State gives two-thirds of the appraised value, the maximum being \$50, so that the highest price you can get for a well-bred animal is two-thirds of \$50.

The college has been working hand in hand with the live stock sanitary board, making these tests together, and the expense of the 30,000 tests reported by the college last year cost the State not one cent. The owners paid for this work themselves or did it themselves; they were taught how to do it. The work carried on by the State board to the extent of about 14,000 tests last year. I can not say how much it cost, but probably about \$15 to \$18 per herd.

Last year the State paid for condemned animals about \$27,000, and there was turned back into the State treasury \$12,000 from the sale of infected (but uncondemned) meat. I do not know of another State in the Union where so much work has been done at such a low cost of operation as has been carried on in Wisconsin. That largely comes from permitting the stock owners to participate in the work by the way of education, and this demonstrative campaign has been the means of doing that.

Last year we had a demonstration at the State fair, witnessed by 3,000 people: the material was left there for two days, and about 10,000 people saw for the first time the ravages of tuberculosis.

Last Saturday a man called at my house late at night, bringing down in his pocket a bottle of material which he wanted to know something about. He said, "I saw that demonstration about a year ago, and I learned enough to open my eyes." He had lost an animal and had brought down the tissues to see if it was tuberculosis, and an examination showed that it was. Wherever we go throughout the State, there is hardly a week passes but we get some indication of the beneficial effect of this demonstrative line of campaign.

By encouraging the farmer to take hold of this matter for himself, putting it on an economic basis, showing him how it touches his pocketbook—and that is where it hurts him—he sees he can not afford to let this matter go along on a laissez-faire theory. In the last three years we have secured 66,000 tests in Wisconsin. The percentage of the disease is running down rapidly; in the whole State this year the average was less than 5 per cent. We have had tens of thousands of dollars brought into Wisconsin this year by people who have been trying to get pure-bred, tuberculosis-free animals.

People say, "What is the use of stirring up all this hue and cry about it, you are hurting the stock industry of the State." As a matter of fact, we are bringing dollars into the State. A man can hardly go out in old dairy regions and buy a hundred head of animals without bringing in a considerable sprinkling of tuberculosis. Many of our stockmen have reached the point where they will not buy anything without it is tested first.

A stock owner can learn how to do this thing and protect himself, and in that way, under restrictions, it is possible for us to handle his products. What is of much importance to us in Wisconsin is to find, in the northern part of the State, that the percentage of disease is very low. We had a post-mortem demonstration in one of our northern counties, one of our dairy counties, and as the result of that one exhibition we got 2,500 cows tested in that one county, and the work was pushed by a newspaper man. They found only about 35 or 40 animals affected in that 2,500, but the disease was distributed in about 15 per cent of the herds tested. Let this go five years longer, and instead of 1½ per cent of animals infected and 15 per cent of herds, you will have 10 to 15 per cent of animals affected. You have got to take hold of this problem right now; and I say, let us not stand on the order of our going and confine our methods to those that can only slowly be put into practice, because it is better to make a few

errors in order to get speedy action than it is to wait until the disease has spread in the herds now started. In a very considerable fraction of the herds involved in some of our counties one-fourth, one-third, or even one-half have the taint of tuberculosis in them. You leave that taint there five years more, and instead of a small percentage you are going to have a large percentage.

When Denmark took hold of this matter the percentage was upward of 40. Suppose we had that percentage in Wisconsin. It would bankrupt the State. That is one of the questions you have to meet in the East. At present in Wisconsin we can diminish the expense very much, because if the meat will pass the inspection we are able to get the beef value of that carcass and the hide. We got last year, as I said, \$12,000 back out of \$27,000.

In reply to a question by J. W. Wilson, of South Dakota, V. A. Moore stated that the tuberculin test works as well in swine as in cattle, only it is a little more difficult to apply; and H. L. Russell said:

I would not say that we can require a tuberculin test for hogs. When the temperature of an animal fluctuates a number of degrees on slight exercise you have a condition which prevents an accurate test.

New York and Massachusetts tried compulsion, and they were ahead of public opinion. Lay your foundation in education. Educate your farmers to the economic importance of this disease. Get a reasonable law to begin with and enforce that; then pull your public up another peg. But for goodness sake do not try to compass the whole thing in one fell swoop, because you can not eradicate tuberculosis in one year, and too drastic action will set you back ten years, like those States which have tried to have too much on their statute books.

In Wisconsin we have been importuned on all sides for compulsory legislation, but we have said we do not want it yet. Why? Because we have not got the public educated enough to stand behind it.

First draw your cordon around your State, excluding untested cattle. This will prevent it from being a dumping ground. Make the railroad responsible for accepting untested cattle for shipment. After a railroad has paid a penalty of \$50 a car orders will go out to each of their agents not to take untested cattle until they know that they are right, so that the railroads are our best help in enforcing the law. Then carry on a public education of your farmers through your institutes or at the universities or agricultural colleges by these post-mortem examinations, if you will, and gradually build up a sentiment in favor of proper education; but if you try to solve the whole question at once, you are apt to excite such opposition as to defeat the very end you strive to attain.

J. H. Shepperd, of North Dakota, called attention to progress made in North Dakota in applying the tuberculin test and the Bang method through live-stock breeders' associations. These breeders were made to see the advantage of getting into a position where they could use for advertising purposes the fact that they had no tuberculous stock. They adopted the Bang method and are all on that basis at the present time. It has thus been found possible in the newer States to get the owners of pure-bred live stock to get together and help keep free from this disease.

#### NOMINATING COMMITTEE.

The following committee on nominations was appointed: J. H. Shepperd, of North Dakota; J. L. Hills, of Vermont; and W. R. Dodson, of Louisiana.

The meeting of the section then adjourned to Thursday, November 19, 1908, at 9 a. m.



## MORNING SESSION, THURSDAY, NOVEMBER 19, 1908.

The meeting was called to order at 9.35 a. m., and papers on the following subject were presented:

## RELATION OF THE EXPERIMENT STATION TO WORK IN INSTRUCTION, WITH SPECIAL REFERENCE TO ITS POPULAR PHASE.

C. F. CURTISS, of Iowa. That there is naturally a close relation between experiment station and instruction work, and that educational work in agriculture has been stimulated, systematized, and popularized by the work of the experiment station, goes without saying. Undoubtedly much of the progress that has been made in agricultural education in the last twenty years is in a large measure due to the foundation that has been laid for such work by the experiment station investigators. The experiment stations have established definite principles in agriculture and have furnished concrete facts of general and of local application. In many cases the stations have been more than agencies of investigation. The wording of the Hatch Act permitted of rather a broad interpretation, and the conditions then existing in a majority of the States called for a broad interpretation. The station investigators have generally had many other duties aside from investigation. Considerable station work has not been investigation proper, but mere demonstration. The station worker has in many instances been a demonstrator, an instructor, and an institute worker as well as an investigator. This demonstration and popular work has doubtless been serviceable and in many cases of great practical value. It has contributed greatly to what has from the outset been the great desideratum—a more general interest in, and demand for agricultural investigation and instruction. This demand has given new life to agricultural education that is widespread and prominent.

The conditions which have led up to this result have not always been the most favorable for the best kind of research work. These conditions are rapidly changing. It is no longer necessary that the station investigator have a multiplicity of duties, permitting him to engage in station work only incidentally. The relation of station work to instruction will be different in the future from what it has been in the past. The Adams fund is being devoted distinctly and definitely to research work. The Hatch fund should be used for essentially the same purposes.

Two new movements are now taking definite form that will serve to differentiate the station from other lines of college work. These are the demand for extension work and the demand for secondary instruction in agriculture.

The organization of the agricultural work in a land-grant college should embrace three distinct branches: (1) instruction, (2) investigation, and (3) extension. Extension work has heretofore been carried on largely by the aid of the other branches. The work has assumed such proportions in most States as to require a separate agency. These three branches must of necessity be closely coordinated. Yet the organization should be such as to leave the workers free to devote practically their whole time to their respective lines.

It is desirable and essential that there be one recognized head for all the activities in each line of work designated as a department in a college of agriculture. It is also just as desirable that the staff include men with distinct and exclusive duties in one or the other of the three distinct branches of each line of work, viz, instruction, investigation, or extension.

While the head of a department should have the responsibility for the direction of all branches of the work covered by his department, he should also have

competent assistants, free to devote their time exclusively to one kind of work. The old argument that teaching strengthens the investigator and that investigation strengthens the teacher, and that both need to do institute work to avoid getting into ruts, sounded good in theory, but never had much foundation in application. Probably, in the training of a man for the highest usefulness in some kinds of work, his experience should cover all of these lines, but he will be likely to have better developed faculties and better work to his credit if he devotes his attention to these lines separately, with a definite period of service in each, instead of an effort to cover all of them in one period.

The better organization of the instruction work in our land-grant colleges and the definite provision for extension work distinct from other lines that is now being made in many institutions, and which will soon be made in all of them, have largely changed the relations of experiment station work to instruction. The necessity for popularizing experimental work has largely passed with the coming of present conditions. Experiment station work should be conducted primarily, with minor exceptions, exclusively for the fixing of basic facts and principles, and not for popular exploiting. Demonstration work and dissemination work, aside from the publication of technical and popular bulletins, should be done by extension agencies rather than with funds appropriated for investigation. There is in every State a demand for more extension and more thorough investigation relating to agriculture. Many of the principles to be investigated and worked out are general, but a large number are somewhat local, and need to be studied in the light of local conditions. The great rapidity with which the land-grant colleges are moving forward in the three distinct lines of activity—instruction, investigation, and extension—with clearer and cleaner cut differentiation in each, seems to warrant our confidently looking forward to stronger, more definite, and more efficient organization for experiment station work in each State. Men are being selected for this work with special reference to their qualifications for research work, and are being put to work on definite problems with ample time, freedom, and facilities, and held responsible for results. As Doctor True has well said in a recent communication, "The old-fashioned combination investigator, teacher, farmer, institute lecturer, and popular writer is happily passing away."

W. R. Dobson, of Louisiana. A discussion of this subject must be limited primarily to expressions of opinion. Louisiana has not made any new discoveries along this line that would entitle her to speak with unusual authority. It was, therefore, determined to secure as much information as possible for the preparation of a general statement regarding the status of affairs pertaining to the subject in the several States and to give a few quotations from the expressions of opinion of directors of stations on the subject.

With this purpose in view a letter was addressed to the director of the experiment station of each State asking for a brief statement along these lines. A letter was also addressed to the Office of Experiment Stations of the United States Department of Agriculture. Presuming that the director of the station would speak for the policy of the institution with which he was connected, no expression was requested from the presidents of universities and agricultural colleges. To this letter 37 directors of stations responded.

Dr. A. C. True gave a very clear and pointed statement of his views upon the subject, though his views are pretty well known by station workers through correspondence, reports, and editorials in Experiment Station Record. Mr. Hamilton also kindly responded with a statement from the viewpoint of an institute specialist.

The stations and agricultural colleges are so related that they can hardly be discussed separately in relation to work of instruction. It is not possible to

satisfactorily classify the colleges and stations. Possibly we could group them by their financial support into groups that should be considered in this discussion: (1) The colleges and stations employing a large number of workers, with large sums of money from their State governments. These are products of years of development. They each had an humble beginning. (2) Some of the stations are comparatively new, and the demand for work is limited and State appropriation restricted or wanting. (3) Those occupying an intermediate position between these classes may be designated as a third class. With great differences in amount and sources of revenue, differences in climate, crops, and people, one would hardly expect to prescribe rules regarding the relation of the station to work of instruction to be applied alike to all stations. So far as I know there has been little or no effort to attain to a uniform standard. On the other hand, there are fundamental principles involved that are applicable under almost all conditions, and the experience of one institution will be most helpful to another; and it is probable that we will ultimately have a degree of uniformity of plan in the larger and richer States toward which the other States may develop as far as their field and funds will permit and demands may require. Some of the colleges that receive liberal support from State funds have organized their work into three general departments: (1) Investigation; (2) teaching of regular college classes; (3) what has been termed "extension work," including farmers' institutes, demonstrations, railroad specials, cooperative work with public schools, and such correspondence as does not pertain to investigations in progress or which does not require the attention of a specialist.

Where this classification of the work has been made, the Federal funds are used exclusively, or almost exclusively, for investigation, and all other expenses are met from State funds. There is a difference, however, as to the details of carrying out the plan. Some institutions have the station men devote all of their time to investigation; likewise others devote all of their time to work in departments 2 or 3. In other institutions a man may work in two or even three departments and draw his salary and expenses of the work from the respective funds supporting the work.

It is the pronounced policy of the Office of Experiment Stations to secure research work entirely from the expenditure of Federal funds, and require the States to furnish the money for other forms of work. Doctor True has put this so clearly that the following lengthy quotation is made from his letter:

When the stations were first organized, there were practically no organizations for the diffusion of agricultural information among the farmers. It therefore seemed necessary that the Hatch fund should be liberally interpreted in order to aid the stations in establishing their work and gaining the support of their proper constituency. The result has been that not only the stations have become firmly established, but the agricultural colleges are now receiving strong support and are constantly getting increased funds which may be devoted to agricultural education.

In recent years a wide movement for extension work of all kinds has developed. The time has evidently come for us to make a clearer differentiation in the functions of the different departments of the agricultural colleges. The stations are the research departments, and Congress has given them the Hatch and Adams funds for this work and the printing of the results. These funds strictly applied to these purposes are not sufficient to meet the needs of the stations for such work, and, as a matter of fact, the States have already largely supplemented them. We therefore feel that under existing conditions the Hatch Act, as well as the Adams Act, should be more strictly interpreted, and none of the Federal money for the stations should be used for farmers' institute work, extension teaching, or preparation of compilations.

These things come within the province of the extension departments of the colleges, and funds should be obtained for this work as well as for the other work of instruction which the colleges are doing. It would, in my judgment, be a great mistake for the stations to oppose our policy in this regard. As



long as it is supposed that the Federal funds given to the stations can be used for extension work, the State legislatures will not be especially moved to provide funds for that work, but when they realize that the Federal money can not be spent for this purpose, I believe they will give the colleges liberal support for the extension work.

In another letter he says:

The Hatch fund should be more strictly applied than ever before to experimental work of a substantial kind, and we do not feel that we can any longer permit the expenditures from that fund for farmers' institute work, extension teaching, or preparation of compilations.

As far as possible the State should supply funds for all demonstration work, farmers' institutes, and popular instruction of any kind, compiled information, and the printing of station publications of all kinds.

There may be some protest against this policy from the weaker stations that receive little or no support from the States, but approval is quite general. They will say that the Hatch bill provides that the money appropriated under the act shall be spent for securing and disseminating agricultural information, and that it would seem that Congress did not care to change this provision, but desired to increase the funds for research work as provided in the Adams Act. However, it is possible that the Congress of to-day would modify the bill somewhat were it before them. Congress has recently been inclined to help the States which are making an effort to help themselves. In the geological survey work, soil surveys, tick-eradication work, etc., this principle has been observed. It seems like a fair proposition that if the National Government furnishes the money for investigation the State government should furnish the money to carry the information to the people. The State governments will undoubtedly appropriate money for educational purposes more readily than for research work. At any rate, the proposition that the entire Federal appropriation shall be spent for research work only, and that funds for institutes and extension work of all kinds must be furnished by the State, will meet with general indorsement.

Turning, then, to the working force these questions are pertinent: (1) Should we have a separate and distinct set of men working under these separate funds? Or (2) should an investigator devote a portion of his time each day or week to educational work and draw a portion of his compensation from the funds provided for this work? Or (3) should a man devote his entire time to research for a period, and then his entire time for a period to educational work? These questions, of course, are old; every director and president has considered them. The matter comes up now for more definite settlement than ever before, because of the provisions of the Adams Act for research work exclusively, and the policy of requiring more research from the Hatch fund, until that shall be devoted almost or quite exclusively to research work. A majority of men working under the Adams fund devote their entire time to research. A majority working under Hatch funds divide their time and draw only a portion of their salary from the Hatch funds. Undoubtedly the work under the Adams fund will hasten the accumulation of data that will be valuable in discussing these questions.

Doctor True has, of course, given a great deal of consideration to this subject, and has discussed it with many leading men. His long experience at the head of the Office of Experiment Stations has given him exceptional opportunities for judging of the effectiveness of the work of men serving in different capacities. Everyone knows, too, of his thorough devotion to the work and his eminent ability to pass on the merits of what has been accomplished. His opinion, therefore, is of very great value. The liberty is taken of again quoting from Doctor True's letter:

It is clear that an efficient station worker must have either practically all his time, or at least a large definite portion of his time, for the work of in-

vestigation and the preparation of reports thereon. This should be his primary business, and everything else that he does should be arranged so as not to interfere with his duties as an investigator. Theoretically, it is well for him to come into close contact with the farmers from time to time, so as to understand their situation and learn all their problems. Practically, this can be well enough accomplished by visits to different parts of the State, often in connection with the investigations being pursued. It does not necessarily involve attendance at farmers' meetings, though this is well enough incidentally, and certainly does not call for the preparation of popular articles or bulletins. The teaching which the station worker should do should be very limited in extent and confined as far as possible to teaching advanced students along the lines in which the investigator is working. The station worker should also be relieved from any large miscellaneous correspondence. As far as possible only letters should be referred to him on subjects on which he is especially expert and which can not be answered by a person well educated generally in agriculture and agricultural science.

For the opinion of directors of stations as to whether or not a station worker should engage in other lines of work, and if so to what extent, I shall take the liberty of quoting from some of the letters received from directors on this subject. There is danger always in making partial quotations that the author may be, in a degree, inaccurately represented. However, time would not permit the reading of entire letters. I have selected those sections of letters most pointed, and with the view of presenting different ideas.

From one of the extremes, if not the extreme, in the separation of the station work from all other work, comes the following expression:

In our station the officials do no work in the college of agriculture, nor do they do any institute work. At special conventions, such as meetings of State boards, where it is desirable to have a topic presented in which the experiment station is actually engaged in work, I think it desirable for the station officials to present papers. In our experience the work of the experiment station since the line has been sharply drawn between instruction and investigation has greatly improved, and I think that this has been accomplished without any injury to the instruction side of the work.

Another director, of almost similar views, writes as follows, in part:

I favor the absolute segregation of experiment station work from every other type of work, including college teaching. I do not think that the best results can be secured any other way. The only exception that I would make to this is in the case of those members of the staff whose work is carried on mainly with State funds.

The letters in hand indicate that a majority of the directors of experiment stations will be glad to devote the Federal funds to research work, but they are not ready to concede that the investigator should cut out work of instruction as completely as is desired by others.

I shall make an extended quotation from one of the directors, who has expressed his views very clearly and forcibly, and I believe his expression will represent the sentiment of a majority. After stating the part taken by station men in his State in institute and extension work, and provision for preventing the encroachment of their work on other duties, he says:

I realize that there is a tendency toward segregation and specialization in all this work and that there is something in the notion that this work has in the past interfered with the more serious, and, in many respects, more important, research and teaching work. I do not believe, however, that the finding of men who are to devote their entire time to this institute work and allowing the men in the college to devote their entire time to teaching, and those in the station to devote theirs to research, will prove to be the remedy. I think it is the best possible experience for an investigator and teacher to come in contact to a reasonable extent at least once a year with the people with whose problems he is laboring. I find in my own case that it is decidedly advantageous to present the results of my experiments and studies to the men who will ultimately need to apply them, in advance of their publication, in order to be

certain to have their point of view and to have their criticism, and to see whether or not I have failed to make them understand what I am driving at. If my presentation of the subject orally to an audience of the most intelligent farmers fails to be readily understood, then my presentation of the same matter in the printed page of a bulletin is likely to fall far short.

Moreover, it gets the college and station man out of his ruts; it broadens his views; it puts him in direct contact with the latest practice and thought, and puts him in touch with the actual problems of the class of farmers which he is endeavoring to help.

Another director, in the close of his excellent letter, says:

I am strongly of the conviction that an instructor is a better teacher for being an investigator, and I am sure that the investigator is improved by a reasonable amount of instruction. There is nothing which so shapes and classifies the ideals of a man in a new field as to be obliged to bring the ends together occasionally and outline the situation as it seems to have developed up to date.

One of our number, of long experience in the West, says he believes in the station men giving a limited amount of instruction to higher classes and that a limited amount of public instruction is desirable. The following is quoted from this letter:

It seems to me that it is very seldom that a research man should be a recluse, and that it is to the advantage of the man himself, to the popularity of the institution, and to the public interest that such appearances should be made. We find that the people of our State desire, exceedingly, personal contact with the men who are undertaking advanced problems for them, and I presume it is so elsewhere. So it seems to me that prohibition of instructional work for station men is unreasonable, but that a careful limitation of such work must be made both with reference to the progress of the work and the effect upon the investigator himself. The amount of such work, I believe, can not be arbitrarily determined. It will vary with the nature of the subject, the temperament of the man, and the attitude of the group of students, or of the public toward both.

From a great agricultural State in the Middle West comes the expression that nearly every member of the staff has "divided duties, giving part of his time to the station work and the remainder to college work of one kind or another." I quote the following:

An employee under the Hatch fund or Adams fund only would be, it seems to me, not properly subject to call for much institute or extension work. I believe it to be, however, to the advantage of the work for investigators to get out among the farmers and learn their views and keep in touch with the actual situation in respect to farm life.

The director of one of our large stations states that he has an understanding with the commissioner of agriculture that each member of the station staff who can do satisfactory institute work may be called upon for two weeks' work each year. Besides this, certain members speak at the large conventions, and this limits the work of the station in popular instruction. He says further:

I believe it to be a mistake to allow members of the station staff, no matter what funds it is working under, provided that fund is appropriated for experiment station effort, to engage in popular work. Such efforts at agricultural propaganda have been a handicap to research work in this country. There is a large field that should be occupied by some research institution in each State and other functions should be left to the State departments and the colleges. These are my views based upon long observation and experience.

Let us look at the question for a moment from the view point of a farmers' institute worker. We have the following from one who has given much study to institutes:

My personal view is that for the present, and perhaps for considerable time to come, it will be necessary for the experiment station workers to participate



quite extensively in the work of giving instruction by lectures and demonstrations outside of college class rooms. Theoretically, the station workers should devote themselves exclusively to experimentation and research and publication of results, but owing to the dearth of teachers capable of properly presenting to farmers scientific truths that the agricultural experimenters are discovering it is almost compulsory upon the station people that they should go out personally and state the facts to farming people clearly and in a way that they will be able to appreciate and put into practice. When the time arrives that a full supply of teachers capable of imparting this instruction is available, then the station workers can devote themselves perhaps exclusively to research and experimentation.

Just how far the stations should go in this teaching work is a question that must be left to the individual station to determine. Certainly at present as much time as can possibly be given ought to be devoted to the introduction of the methods that the stations have discovered to be improvements upon the present practice of the farming people in the several States.

One of our former presidents says that it is seldom that members of his staff give more than ten days to institutes, the officers exercising their judgment in the matter. He closes his letter as follows:

I am of the opinion that it should be the policy of the station to promote in every legitimate way the education of the farmer, both directly and indirectly, because I believe that the usefulness of an experiment station is based upon the intelligent appreciation of those for whom the work is done. Very often a station officer can gain much more assistance in the prosecution of his work by a day spent among farmers than by confining himself closely to the laboratory.

Many other directors have expressed opinions just as worthy of consideration as those quoted, but it seems unnecessary to take more of your time for giving them here. It seems to me to be the opinion of a majority of our most experienced men that most investigators are improved by contact with the men whom these investigations seek to benefit; that unless there is some special disqualification for public appearance, the most efficient investigator should engage in institute work for a week or two of each year; that he should appear before State and district agricultural associations as frequently as may be necessary for the discussion of the topics on which he is working; that he should answer a limited amount of correspondence in his special line, in which the most complete answer to inquiry would require the opinion or knowledge of a specialist. That under some conditions, and with some subjects, a limited amount of instruction to advanced students or graduate students is desirable; such lectures to be mainly limited to methods of investigation in his special line. In some institutions the head of a department may be employed in investigation, in teaching in the college, and various forms of extension work. Such men, however, should have assistants devoting their entire time to each of the departments of work. This is possible only in the larger institutions. Of course, the amount of time devoted to station work should determine the portion of salary paid by the station.

At first consideration, the two quotations made may seem to indicate that Doctor True desires the stations to withdraw from practically all forms of institute and extension work, but such is not the case. It was through the efforts of Doctor True that a Farmers' Institute Specialist was added to the force of the Office of Experiment Stations, and all know of the splendid work accomplished by Mr. Hamilton in that capacity. No one is more prominent than Doctor True in the study of the best method of extension work, and of agricultural education. The Office of Experiment Stations is identified with the best work in these lines. And I believe there will be no difficulty in adjusting any minor differences of opinion on these things, provided there is unity in the aims and purposes of accomplishing the greatest amount of research of the highest possible character

from the expenditure of the Federal funds, and the greatest possible amount of extension work of most efficient character from State funds.

W. H. JORDAN, of New York. The discussion of this question falls conveniently and logically under three heads:

(1) The intent of the laws establishing and endowing the experiment stations receiving Federal aid.

(2) The needs of agriculture.

(3) The requirements and expediencies of administration.

Concerning the intent of the Hatch and Adams acts there can be no reasonable doubt. By the Hatch Act it is made "the object and duty of said experiment stations to conduct original researches or verify experiments" on a great variety of subjects important to agriculture, and the Adams Act declares that the money which it appropriates shall "be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry of the United States." It is plainly the purpose of the Federal Government to aid the States in establishing and maintaining special agencies for agricultural inquiry, and the various States have accepted this Federal aid under the terms of the two acts quoted, and are in many cases appropriating additional money under such terms. Indeed, under the law the State has no right to ask a station official to use the time for which he is paid by Federal funds on anything but conducting or administering real agricultural inquiry. Surely there is no legal justification for the use of an experiment station as an agency for popular instruction, and there seems to be no reason for an extended discussion of this phase of our subject.

But, assuming that there were no statutory obstructions to using an experiment station for any or all kinds of agricultural service, in view of the present needs of agriculture what should be the attitude of an institution of this class toward participation in the effort of popular instruction? Is the need for such instruction so great in relation to other needs as to justify diverting the energy of an experiment station staff to educational service of that kind? Is it more important to diffuse among the masses what we do know than to find out some things we do not know? Answers to these questions based on individual environment and experience would doubtless differ materially. My own conviction is that, outside of certain social and economic considerations, the progress of agricultural practice is now more dependent upon the acquisition of new knowledge than upon the enlarged spread of the knowledge we now possess.

First and fundamentally, the experiment station is the main source of agricultural class-room instruction. What agricultural college instructor does not feel the overwhelming need of a larger and more accurate knowledge of the facts and principles he is asked to teach? Who of us has attempted a comprehensive study of the literature on any one subject without being made painfully aware of the almost discouraging incompleteness and inconclusiveness of available data? Again, we greatly need more knowledge for the enlightenment of practice. Under the fire of searching and insistent questions from wide-awake farmers, how often we hedge in our answers, or else frankly confess our ignorance. In the management of the soil, in the nutrition of animals, in the improvement of plants, in the combating of pests, and in other directions we still see but dimly. Agricultural science is still in its childhood, and under our present system of organization its growth to a fuller stature must be largely nourished from the experiment station. In so far, then, as the energies of this agency are diverted to efforts other than those of research we are delaying the progress of agricultural knowledge. It seems rational to assert, therefore, that an experiment station is no more justified in engaging directly in the work of popular instruction on the basis of agricultural needs than on the basis of law. It may be

said, of course, that when the State itself provides the funds it may assign any duties whatever to a station staff; but just so far as these duties lie outside the work of real inquiry, the name "experiment station" becomes a misnomer.

But I suspect that the difficulties that lie in the matter before us are those of administration rather than of the interpretation of law or of the determination of agricultural needs. It is along this line that the director of a station faces perplexing questions—at least I have found it so. It is clear that the results reached by station investigations should be made available to the farming public, but what shall we understand by "available?" Some of us hold, at least in practice, that station results are made available by bulletins so written as to be understood by nonscientific men. On the other hand, it is asserted with more or less truth that a large majority of farmers do not read bulletins, or else do not understand their practical bearing, and that the only way to make the agricultural masses really comprehend the utility of what a station is doing is by a widespread missionary campaign of demonstration and popular addresses, even to the extent of using railroad trains. Doubtless such popular efforts are productive of good, but the point is, Who shall be the missionary? Is the station investigator to be made a vicarious atonement for the indolence and indifference of a part of our agricultural people? It must be confessed that there is a lively demand for station men to engage in popular instruction at farmers' institutes, through addresses before special agricultural bodies, by means of practical demonstrations, and by personal advice. Those who ask to have these things done enforce their demands by such arguments as these: "It is the only way that the people will come to understand what the station is doing;" "It is necessary for the station staff to meet the people in order to learn what are the people's problems;" "the public demands to hear from the men who work out results;" "if the station is to be well supported by appropriations, it must cultivate public sentiment and secure the backing of the farmers"—these and other arguments are presented to the station director as reasons why his associates should "get out" among the people.

Some of these arguments appeal with much force to those of us who feel responsible for the success of the institutions with which we are connected. We are anxious that our work shall become effective in practice, that our institutions shall stand well with the people, and that they shall receive adequate financial support. We do not like to disappoint good friends when they make special requests for popular or personal service of some kind. But we face this fundamental and imperative fact that a member of a station staff can not be an efficient investigator and engage to any considerable extent in popular instruction. I make this assertion on the basis of twenty-three years' experience in administering a station. I have seen its truth illustrated again and again in interrupted or delayed investigations, in an accumulation of undigested data, and in other ways. If we allow the station to usurp the place of the college as a means of popular education, we might as well forsake investigation, in doing which we would abandon the very purpose for which the stations were created; and so we sometimes feel that on the one hand we have the Scylla of popular disapproval and on the other hand the Charybdis of scientific failure. Under these circumstances it is not always easy to hold a station staff to the policy of engaging chiefly in the work of real inquiry.

Just a word as to the arguments that are advanced to justify the work of popular instruction by station men. It is very essential, to be sure, that the people shall know of the station and its work, but exploitation by the staff can not be carried beyond certain bounds without sacrificing the best interests of all concerned, and such a sacrifice is not necessary. The great body of intelligent farmers has no difficulty whatever in learning about and applying station



conclusions through bulletins and correspondence, and if the indifferent or indolent portion of the agricultural community must have the spirit and means of progress injected into it by itinerant agricultural missionaries, some other agency than the station should attend to these remedial measures.

Nothing is more important than that the station workers shall establish a sympathetic relation with their constituency, but there is a limit to what can be done in the way of personal contact. Attendance by members of the station staff upon the meetings of the large agricultural bodies where the leaders of agricultural sentiment and practice assemble is about all that can be done in this direction.

It is obvious that in order for a station's energies to be exerted in the most useful way there must be at the station a knowledge of the problems that most need attention, but this information can best be gained by special, well-directed trips of observation rather than from contact with audiences.

Demonstration work in the field or elsewhere is a most efficient means of popular enlightenment and a stimulus to better practice, but when a station has ascertained in a practical and business-like way the extent and manner of usefully applying new principles or facts, anything further should be turned over to instructional agencies.

There is truth in the assertion that the public often demands to hear the men who accomplish investigational results rather than those who simply tell what others have done. The fact that a speaker can say that "I did this" undoubtedly adds force to his words. Here, again, we must recognize the imperative nature of the situation. There is going on a strenuous and widespread effort of popular instruction. It is out of the question for either college or station men, or both combined, to carry this work. The need now is for specially trained men who shall be assigned to institute work and other forms of agricultural propaganda as their main function. To these men should be left chiefly the popular exposition of knowledge emanating from the station.

Adequate financial support is essential to the welfare of a research agency, but if appropriations must be purchased by prostituting a station to popular effort, such an institution might as well not exist and allow the concentration of funds in those institutions specially designed for instructional work.

In presenting my point of view as to a wise administrative attitude, perhaps I can not do better than to state what is the policy I have tried to maintain in the institution with which I have the honor to be connected, and I ask you to pardon a reference to personal experience. When I accepted my present position about twelve years ago I was advised by certain friends of agriculture in New York that the station must be made more popular, and that in order to accomplish this result myself and associates must meet the people. It was urged that the staff should engage actively in institute work and other forms of popular appeal to agricultural sentiment. These admonitions did not coincide with my ambitions for the institution with which I had joined my fortunes nor with my conception of the true function of an experiment station. I conceded that following such advice might result in temporary advantages, but I was convinced that this course would lead to no definite and distinct end unless to make the station simply an extension of the instructional agencies already existing. I believed, and I still believe, that while a research policy does not immediately appeal to the popular mind and demands for a time the exercise of faith on the part of the public, the determination of any new principle or fact that has an important bearing on agricultural practice does more to establish an institution in public good will and justify its existence in the minds of intelligent people than can ever be accomplished in these directions by much talking and writing. Besides, I felt that I had no right to divert public funds

from the uses to which they were assigned by law, no matter what the temporary verdict of an indiscriminating public might be. The State of New York had organized the station as an agency for a specific work and had assigned to other agencies the function of popular instruction, and I did not see why the station should be forced out of its field by considerations of mere expediency. I adopted, as nearly as I could, a research policy, and so far I have seen no reason to regret my decision. The present attitude of the people of the State and of their legislature indicates that no mistake was made.

The arrangement under which we are now working in New York is this: Each member of the station staff is allowed to devote two weeks of his time annually to institute work, provided this is done in a single block of time or in two blocks of time of a week each. It is also understood that members of the staff will address the conventions of a few of the important agricultural organizations of the State whenever invited. Occasionally we hold a field meeting at a point where we have conducted some especially important experiment and desire that farmers shall see the results. We also join each year with the college of agriculture in conducting a so-called "normal institute" for the benefit of institute speakers. Invitations to speak at picnics, granges, clubs, and other meetings of farmers and to do itinerant work are, as a rule, declined. We do annually answer thousands of letters of inquiry, a duty that, however necessary, is sometimes a serious handicap. We prepare few bulletins of a general informational character, and we engage only to a small extent in newspaper writing. I am willing to confess that pressure from outside has occasionally caused us to compromise somewhat with what I regard as the right policy. I am aware, also, that having once opened the door ever so little to popular effort, it has a way of most insidiously creeping into larger and larger demands. During the years 1906 and 1907 we allowed our good nature to get the best of our judgment, and in the fall of 1907 I found on inquiry that myself and associates had on our hands material for 24 bulletins which we had been unable to prepare, largely because of outside work. I mean that this shall not occur again. It was wrong and was an injustice to ourselves and to our constituency.

My answer, then, to the question embodied in our subject is this: The staff of an experiment station should sustain only an indirect relation to popular instruction. My reasons for this answer, briefly enumerated, are the following:

(1) Existing laws unequivocally define the function of an experiment station to be that of inquiry.

(2) The relative needs of agriculture clearly call for a vigorous prosecution of research efforts. It is only through such efforts that a station ultimately justifies its existence.

(3) An investigator to be efficient must remain mostly within the atmosphere of inquiry and should not have his continuity of thought and effort frequently interrupted by duties foreign to his general trend of effort.

(4) The necessary acquaintance with agricultural men and needs can be secured in ways that contribute to the proper work of a station without using time extensively in popular instruction.

(5) When a station has adequately published its conclusions in forms adapted to use by teachers and by the general public its responsibility ceases, and any further distribution of this information should be carried on by teaching agencies of one form or another.

E. D. BALL, of Utah. We have had, it seems to me, about as clear-cut and concise a definition of the relation of station work and station men to the extension work that could be possibly presented. It is ideal. In the smaller States, however, it is not practicable; it is not possible, as I see it, to provide separate

forces for research and instruction. If we should use the \$26,000 of Federal funds in that way and provide the equipment necessary for that work, we could probably have not more than three good men for research work.

We should not confuse the idea of a station man, paid by station funds, doing extension work, and the possibility of independent station work and extension work or some other form of work paid for from different funds. That is the problem that we have to face in the western country.

I will certainly agree that there is absolutely no justification in this day and age for taking a man's time paid for out of station funds and using it for anything except station work. I agree entirely with the ideal interpretation of the Hatch and Adams laws; but Utah is not big enough, has not funds enough, to keep three complete agricultural staffs—for teaching, extension work, and station work. I am satisfied that a separate staff for institute work is not desirable.

If there are funds enough available for separate staffs, this is certainly ideal. Yet, going back in my memory, I know of some pieces of investigation, some of the best I have ever come in contact with, being done by men receiving not more than \$300, \$400, or \$500, or, at the outside, \$600 a year from the experiment station. One of the best pieces of investigation going on in our State this year is costing us \$400 a year.

I can not accept the view that it is an old-fogy idea that an investigator needs any instructional work to keep him brightened. I think it a mistake to get the investigator into the laboratory and keep him away from contact with the people of the State and with the bright class of students around. There are, however, certain lines of investigation work in which this will be necessary.

I indorse practically all that has been said, but I want to suggest that it is not the ideal but the actual that we have to realize.

As I see it, this phase of the question is: Can a man do thoroughly accurate investigation work and do this other work? Can it be so arranged that he can? I think it can be done and must be done in many cases in the West under present conditions.

The problem in the small institutions resolves itself into these two questions: What is the best use of the money appropriated by the State? And, secondly, is it possible to separate the investigator, the instructor, and the extension man in the small colleges? I grant it is in the larger colleges, but I do not grant that it is feasible, practical, or financially sound to separate the departments in the small colleges. I do not believe it gives good results.

L. G. CARPENTER, of Colorado. It seems to me you can not lay down an absolutely general law. Almost every State has historical development, and we must build upon conditions as we find them. Some of the Western States have some conditions in which the college helps the station very materially. It is so in my own State of Colorado. The college has recognized that under the State law it can help the station, so that for years it was the case that many of the most prominent station men were only paid one-fourth of their pay from the station and three-fourths from the college, but they arranged as near as they could to give the station three-fourths of the time.

There are also, it seems to me, two points in investigation work that I have not heard referred to, and that is that in such work there is a portion that might be termed origination and the other is drudgery, the carrying out of the creative work into investigation. The creative work is of rather rare quality and may be confined to rather short periods. It is, however, the part that is often the most difficult to attain, and, it seems to me, requires not only special



training, but perhaps special surroundings in order to bring about the proper conditions.

In the carrying out of the work of investigation the only limit is that of physical ability. An investigator may work almost without limit after he has gotten his problems worked out.

The question with which I am mainly concerned is the relation between the station and the college under the conditions in an institution such as I represent. Some States have developed so that their stations are entirely separate and independent of the college, even to the extent of duplication of laboratories and men. Is that the best form of organization under conditions such as I have mentioned?

We have worked out the problem to this extent, that we are bringing the teaching into a limited portion of the year. I believe it would be better for a man to teach three hours per day for one term than one hour a day for three terms. An hour a day in teaching breaks up that day, or at least a large part of it, certainly so far as anything but the drudgery part is concerned.

In an article bearing on this subject Dr. David Starr Jordan takes the view that a good investigator generally makes a good teacher—almost invariably an inspiring teacher—and that the administrative work that grows with the development of his department and absorbs his time is, after all, a kind of penalty because he had proved himself a good investigator. That has been, I presume, the case with a great many of the directors, that they probably proved themselves good investigators and that brought with it the penalty of administrative work which breaks up their work as investigators.

There seems to me not much question about the interpretation of the Adams Act. I am pleased with the high standard taken by the Department of Agriculture. The interpretation is to make the Adams Act principally a research fund. In the Hatch fund we have a larger range of interpretation, but I believe that the Hatch Act is going to be put more and more upon the same basis as the Adams Act. We are attempting to reach this basis and to keep the two funds narrowly within the range of the Adams fund. I believe that should be done.

W. H. JORDAN. I think the relations a man may sustain without injury to his work depend to a large extent upon the type and severity of his environment. We need more of comprehensive, severe inquiry. We have not adequately understood what inquiry is. As soon as we get on the right line of inquiry the work of the investigator will become so absorbing and will require such concentration of attention that he will not be fitted to undertake more popular forms of educational work.

C. H. FERNALD, of Massachusetts, explained the character of the work of the graduate department of the Massachusetts Agricultural College, which has been in operation some ten or twelve years, and said:

"The work has been along a number of lines; in fact, nearly all the lines that are taken up in the experiment station. Knowing that the students in this department would be called into the active pursuits of life, we have studied and kept our finger on the public pulse to see what was demanded and what would best fit them for the work, and having that in view all the time the work has been in a measure just the kind of work that is needed in an experiment station. The work of this department is of mutual benefit to the college and the station."

H. P. ARMSBY, of Pennsylvania. There are two elements which enter into real research, viz, imaginative or creative work and drudgery. The former we recognize as the essential thing in all questions of research. It seems to me

that the essential thing to keep in mind here is that the conditions must be kept favorable for this creative side of research work.

Now, we can not set a man down before his desk at 9 o'clock on Monday morning and tell him to do some creative work between that and 12 o'clock. He has to study over the results of the drudgery side of the work to see what it indicates. He has got to spend a good deal of time when it looks as though he was not doing much of anything. That is a thing that must be allowable, must be taken into consideration, in all these administrative matters. The research man must have time for brooding over his work, and to follow and keep in close touch with its details. He must have opportunity for a continuity of effort.

J. L. HILLS, of Vermont. Professor Armsby has said that in his judgment two halves of a man are not equal to one man, and that four-fourths of a man are not equal to anything. In Vermont, as we have police and other kinds of work to do, we strive to arrange so that there will be a definite time, not in parts of a day, but in terms of a month, for investigation work. For example, in the months of March, April, and May the chemists confine themselves to police work and have the remainder of the year for other work. In like manner, in the matter of teaching, the hour plan and sequence of the studies has been so arranged that this work comes entirely in one-half of the year. I think by blocking out the work in that way better results, as far as investigation is concerned, can be secured. In my judgment, the whole matter is one of local conditions.

C. D. WOODS, of Maine. The experience of the Carnegie Institution seems to me to bear some reference to ours. In the universities, where the sciences are being studied, the great body of scientific information has been obtained by men who were primarily teachers, and when the Carnegie Institution was established it seemed that the natural way to arrive at the information in the most rapid way was to give amounts of money to the more distinguished men connected with great institutions for purposes of study. So in the first days of the establishment of the Carnegie Institution moneys were given to men of this institution and that all over our country for the purpose of investigation, following along in the lines in which the great body of truth had accumulated in Europe and America. This plan has been gradually abandoned, and special men are being employed and laboratories built specifically for scientific investigation. It seems to me that we want to profit by this experience and separately provide for investigation. This is largely a question of administration.

The final criterion to which we should bring the question of research is not what is best for the immediate good of the agriculture in any particular State, but what is the great fundamental need of agriculture. I would be very glad to see the day when dean and director are two distinct officers. Then most of these questions that we are talking about here to-day will disappear.

E. A. BURNETT, of Nebraska. About 8 per cent of the institute work in Nebraska last year was done by men who had some connection with the college or station. This does not seem satisfactory to me from the standpoint of the publicity of the work of the station, and we are seeking to find some way by which we can get more of our men before the public. The only feasible way in our case seems to be to employ men who shall be used by the experiment stations, not in any creative sense at all, but in field work and minor work which will familiarize them with the work and the results of the station, but not put upon them any of the burden of the creative work of the station, and have them available for institute work.

It occurs to me that Nebraska ought to be able in the next year or year and a half to put five or six such men in the field—men who can help conduct cooperative or demonstration experiments sufficiently to become familiar with what the station is doing. These men will not be paid from Federal funds at any time, but wholly by the State, and during the institute season they will be able to give the results of the station work to the people probably in a better way than could be done by a man who has no connection with the station.

I also want to raise the question whether, instead of every station trying to cover the whole field of agriculture in its State, it would not be better for the station to study three, four, or five problems in the State which would not require the whole faculty of the agricultural college, and when it had valuable information would put it before the people. It seems to me that we would get in that way a more economical use of the funds which are intended for investigation than we now get in many cases.

I do not know how to put that plan in operation in Nebraska, but I thoroughly believe that that would be the greatest step forward that could be made in our State, and in the end would enable us to solve larger problems and to have a greater influence on the agricultural practice in the field than is possible by the present method.

C. D. WOODS. It may be desirable for a college to be as symmetrical as possible, a strong station need not be. A few lines of work can be carried on successfully where a large number probably would not be. A few years ago all of the agriculture in the agricultural department of the University of Maine was duplicated in the experiment station, but the lines of work in the station were reduced to four. There was some criticism when this was coming about, but people have forgotten about it now that so much stronger work is being done in those few lines.

We may have been unwise in the choice of lines of work, but we are not unwise in the concentration of effort on a few things and having a few strong men with a corps of assistants who can accomplish something within narrow fields. We have set ourselves down to try to find fundamental truths as far as we can in four distinct lines.

L. G. CARPENTER. I think this idea of cutting down to a few lines of work is one that we are working toward, and the administration of the Adams fund is going to help us very much. But it is harder to determine what are the most fundamental requirements in Colorado and other large Western States with wide range of climatic and other conditions than in the smaller, more uniform Eastern States. It takes a great deal more knowledge of the newer State than has been acquired yet to know what are the most important lines of inquiry.

F. B. LINFIELD, of Montana. When you reflect that in Montana we are trying to spread one station over 142,000 square miles, with extremes of altitude and climate, in a State to which the first settler came only forty years ago and in which the first attempt to study agricultural conditions was made only ten years ago, you will see the problems we have to investigate. Concentration of the work of the stations is something we are striving for, but it will take time and funds to bring about the ideal condition. We have the threefold work, but are trying to keep them as distinct as possible; we are putting stress on the legislature for aid in this, and the Adams fund is helping us. We say, the Adams fund is given us for research, and the State must give funds for other work. It is intended that no station man shall devote more than two weeks in the year to institute work, except occasional calls to general meetings. It is easier to accomplish this with 350,000 people than it is with a few million people.



E. D. SANDERSON, of New Hampshire. Have not we been considering this matter from the standpoint of the States in which the practice of the better agriculturists has caught up with the work of the stations, and have we given enough consideration to those States where practice is behind the work of the stations? I happen to come from one of the States where practice is, I believe, from ten to fifteen years behind the work of the stations. What we need under such conditions is extension work. Is there not as much reason why the Federal Government should make an appropriation for that work as for investigation? How this shall be organized I am not going into. But it seems to me there is quite as much reason why we should have an appropriation for this sort of work as for the other on very many grounds. In the States which need it the most it is the hardest to get it, because the need of it seems not to be realized. I think we ought to seriously consider an appropriation to do this work of demonstration in each State. I believe it is just as necessary as any other phase of our work.

#### ELECTION OF OFFICERS OF THE SECTION AND MEMBERS OF THE EXECUTIVE COMMITTEE.

The following officers were nominated and elected for the ensuing year: Chairman, P. H. Rolfs, of Florida; vice-chairman, E. J. Wickson, of California; secretary, F. B. Linfield, of Montana; members of the executive committee, W. H. Jordan, of New York, and C. F. Curtiss, of Iowa.

The programme committee for this year recommended as topics for discussion at the next convention, "The relation of problems in irrigation, drainage, and engineering," and "The relation of directors of experiment stations to other members of the staff."

The programme committee was given authority to change the topics of discussion if deemed desirable.

The meeting of the section was then declared adjourned.

## INDEX OF NAMES.

---

- Adams, C. F., 9.  
 Andrews, E. B., 9.  
 Armsby, H. P., 8, 10, 18, 38, 117.  
 Atkeson, T. C., 10, 28.  
 Aylesworth, B. O., 9.  
 Ayres, B., 8, 18.  
 Bailey, L. H., 18, 48.  
 Bain, S. M., 10.  
 Ball, C. R., 10.  
 Ball, E. D., 10, 115.  
 Beach, C. L., 9.  
 Beach, L. A., 10.  
 Beal, W. H., 10.  
 Bell, J. F., 10, 26.  
 Benton, C. R., 9.  
 Bishop, W. H., 10.  
 Boss, A., 9.  
 Bowker, W. H., 9.  
 Brodie, D. A., 10.  
 Brooks, W. P., 9, 47.  
 Brown, E. E., 10, 27.  
 Buckham, M. H., 8, 10, 15, 18, 45, 62, 75, 87.  
 Buckley, S. S., 9.  
 Burkett, C. W., 10.  
 Burnett, E. A., 9, 28, 118.  
 Burnett, Mrs. E. A., 9.  
 Burrows, T. K., 10.  
 Butler, T., 10.  
 Butterfield, K. L., 8, 29, 38, 42.  
 Card, F. W., 10.  
 Carpenter, L. G., 9, 38, 48, 116, 119.  
 Carroll, J. S., 9.  
 Cates, J. S., 10.  
 Cavanaugh, G. W., 10.  
 Christie, G. I., 9.  
 Clark, F. N., 9.  
 Clinton, L. A., 9.  
 Close, C. P., 9.  
 Cobb, N. A., 10.  
 Cole, J. S., 10.  
 Connell, J. H., 10, 81.  
 Cook, M. T., 9.  
 Corbett, L. C., 10.  
 Corley, J. W. L., 10.  
 Creelman, G. C., 10.  
 Crosby, D. J., 10.  
 Curtis, R. S., 10.  
 Curtiss, C. F., 7, 8, 9, 39, 43, 44, 45, 46, 105, 120.  
 Dacy, A. L., 10.  
 Davenport, E., 8, 9, 47, 65, 87.  
 Demarest, W. H. S., 9, 76.  
 Derr, H. B., 10.  
 Dodson, W. R., 9, 104, 106.  
 Donaldson, M. L., 10.  
 Duggar, J. F., 7, 9, 38.  
 Duniway, C. A., 9.  
 Dunlap, R. W., 10.  
 Dunn, J. J., 10.  
 Edwards, H., 8, 10, 63, 80, 86.  
 Eidsness, L. M., 10.  
 Elliott, J. C., 10.  
 Emslie, B. L., 10.  
 Evans, W. H., 10.  
 Fellows, G. E., 9, 65.  
 Fernald, C. H., 9, 117.  
 Fletcher, S. W., 10.  
 Foord, J. A., 9.  
 Fortier, S., 10.  
 Fortier, Mrs. S., 10.  
 Foster, L., 10.  
 Frear, W., 10.  
 French, H. T., 7, 9, 29, 38, 45, 49, 102.  
 Fuger, F., 10.  
 Garrison, W. E., 10, 75.  
 Gibbs, W. D., 7, 9, 45.  
 Gigault, G. A., 10.  
 Glasson, E. J., 10.  
 Graham, C. K., 10.  
 Gwinner, H., 9.  
 Haecker, T. L., 9, 48.  
 Hall, D., 15.  
 Hamilton, J., 10, 84.  
 Hamilton, J. M., 9, 79.  
 Hanna, C. M., 9.  
 Harcourt, R., 10.  
 Harding, H. A., 10, 98.  
 Harding, Mrs. H. S., 10.  
 Hardy, J. C., 9.  
 Harlow, G. A., 10.  
 Harper, J. N., 10.  
 Harrington, H. H., 10.  
 Harter, G. A., 9.  
 Haverstad, T. A., 10.  
 Hays, W. M., 8, 10, 38, 42, 48, 52.  
 Herff, B. von, 10.  
 Hill, D. H., 10.  
 Hills, J. L., 7, 10, 17, 29, 45, 47, 104, 118.  
 Holden, P. G., 9.  
 Holland, E. B., 9.  
 Hooker, W. A., 10.  
 Hopkins, A. D., 10.  
 Hopkins, C. G., 9.  
 Hunt, T. F., 7, 10, 38, 47, 48.  
 Hurd, W. D., 9.  
 Huston, H. A., 9.  
 Hutchinson, W. L., 9.  
 Hutt, Mrs. W. N., 10.  
 Jaffa, M. E., 9.

- Jenkins, E. H., 7, 9, 45.  
 Jesse, R. H., 18.  
 Johnson, T. C., 10.  
 Jordan, D. S., 38.  
 Jordan, W. H., 7, 10, 38, 43, 45, 112, 117, 120.  
 Kerr, G. G., 9.  
 Kerr, W. J., 7, 10, 38, 44, 45, 77, 87.  
 Keyser, V., 9.  
 Kilgore, B. W., 10.  
 Knight, H. G., 10.  
 Knight, H. L., 10.  
 Latta, W. C., 8, 9, 42.  
 Lauman, G. N., 26.  
 Leavitt, S., 10.  
 Lehmann, W. G., 10.  
 Linfield, F. B., 7, 9, 45, 119, 120.  
 Lipman, J. G., 9.  
 Lloyd, E. R., 9.  
 Lyon, T. L., 10.  
 McDonnell, H. B., 9.  
 McElroy, W. O., 9.  
 McKeen, B. W., 9.  
 McLean, G. E., 9.  
 McNair, A. D., 10.  
 McNair, Mrs. H. L., 9.  
 Mann, C. D., 10.  
 Marshall, C. E., 9.  
 Mellick, C. W., 9, 102.  
 Mell, P. H., 7, 10, 45, 68.  
 Merica, C. O., 10.  
 Merrill, L. A., 10.  
 Miller, A. M., 9.  
 Miller, T. E., 10.  
 Montgomery, C. W., 10.  
 Moore, C. C., 10.  
 Moore, V. A., 10, 88, 101, 104.  
 Morgan, H. A., 10.  
 Morman, J. B., 10.  
 Morse, E. W., 10.  
 Myers, W. S., 10.  
 Nichols, E. R., 9, 79.  
 Norton, J. B. S., 9.  
 Novik, P. M., 9.  
 Patterson, H. J., 9.  
 Patterson, J. K., 9, 53, 67, 68, 82.  
 Patterson, Mrs. J. K., 9.  
 Pearson, R. A., 10.  
 Pinchot, G., 38.  
 Poindexter, C. C., 10.  
 Pollock, W. P., 10.  
 Post, W. L., 10, 32.  
 Powell, G. H., 10.  
 Price, H. C., 10.  
 Pritchett, H. S., 49.  
 Putnam, G. A., 10.  
 Rane, F. W., 9.  
 Rane, Mrs. F. W., 9.  
 Ranger, W. E., 10.  
 Rankin, F. H., 9.  
 Rankin, M. C., 9, 15.  
 Reber, L. E., 10.  
 Robertson, J. W., 10, 15.  
 Rolfs, P. H., 7, 9, 45, 87, 120.  
 Russell, H. L., 10, 94, 102, 104.  
 Sanderson, E. D., 9, 120.  
 Scherffius, W. H., 9.  
 Schulte, J. I., 10.  
 Scott, G. E., 10.  
 Scovell, M. A., 7, 8, 9, 44.  
 Scovell, Mrs. M. A., 9.  
 Shaw, R. S., 9.  
 Shear, C. L., 10.  
 Shepperd, J. H., 10, 104.  
 Sherman, W., 10.  
 Silvester, R. W., 9, 28.  
 Skinner, J. H., 9.  
 Sledd, A., 9, 53.  
 Smith, C. B., 10.  
 Smith, F. B., 10, 15.  
 Smith, H. R., 9.  
 Smith, J. B., 9.  
 Snyder, H., 9.  
 Snyder, J. L., 7, 9, 15, 28, 29, 30, 38, 44, 45, 82, 87.  
 Snyder, W. P., 9.  
 Snyder, Mrs. W. P., 9.  
 Soule, A. M., 8, 9, 17, 42.  
 Sparks, E. E., 10.  
 Spencer, A. E., 9.  
 Stene, A. E., 10.  
 Stevens, F. L., 10.  
 Stone, W. E., 7, 9, 38, 45, 73, 78, 81, 87.  
 Storms, A. B., 7, 9, 45, 49, 81.  
 Summers, H. E., 9.  
 Sweetser, W. S., 10.  
 Symons, T. B., 9.  
 Taft, L. R., 9.  
 Taylor, F. W., 9.  
 Thatcher, R. W., 10, 38.  
 Thom, C., 9.  
 Thomas, Miss E. W., 10.  
 Thompson, W. O., 7, 8, 17, 26, 45, 60, 87.  
 Thorne, C. E., 7, 8, 10, 44, 45.  
 Tillman, J. N., 9.  
 Tolman, L. M., 10.  
 Towar, J. D., 10, 17.  
 True, A. C., 7, 10, 26, 30, 31, 35, 45.  
 True, G. H., 9.  
 Van Hise, C. R., 8, 28, 42, 48.  
 Voorhees, E. B., 8, 9, 101.  
 Ward, A. R., 9.  
 Ward, C. H., 10.  
 Washburn, J. H., 10.  
 Waters, H. J., 9, 46, 47.  
 Webster, E. H., 10.  
 Weld, I. C., 10.  
 Westgate, J. M., 10.  
 Wheeler, B. I., 9.  
 Wheeler, H. J., 8, 10, 47.  
 White, H. C., 7, 9, 15, 38, 44, 46, 47, 48, 49, 59.  
 Wickson, E. J., 7, 9, 45, 120.  
 Willard, J. T., 9.  
 Wilson, Jasper, 10.  
 Willson, J. W., 10, 104.  
 Withycombe, J., 10.  
 Wright, C. D., 38.  
 Woods, C. D., 8, 9, 28, 46, 47, 102, 118, 119.  
 Working, D. W., 10, 29, 43.  
 Worst, J. H., 10, 52.  
 Zavitz, C. A., 10, 15.





